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HORSESHOE KIDNEY *

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The correct diagnosis of various renal anomalies often materially affects the surgical prognosis, especially in cases of horseshoe kidney. The abnormal structural relations, the unusual attachments, and the unrotated position of the renal pelvis require a surgical approach different from that employed in dealing with normally situated kidneys. The numerous and anomalous blood vessels, and the fixity and location of the renal mass necessitate an accurate anatomic recognition of the condition for the carrying out of any successful surgical procedure.

Although the horseshoe kidney may function normally, owing to its unusual location and deficient pelvic drainage, it is relatively vulnerable to disease and trauma. It is not infrequently discovered during exploration for other abdominal conditions and at necropsy. A patient with a horseshoe kidney may live the normal length of life. Beyer [1] collected ten cases in which the patients lived from sixty-three to seventy-nine years. Of 320 cases collected by Botez,[2] fifty-two of the patients were incapacitated as a result of the renal condition.

The morbidity of horseshoe kidney is clearly seen in the relation between its occurrence and the frequency with which it requires surgical interference. In a collected series of 68,000 necropsies, Carlier and Gérard [3] found eighty horseshoe kidneys, one in every 850 bodies. From Jan. 1, 1910, to Jan. 1, 1920, 2,424 operations were performed on the kidney at the Mayo Clinic, for various conditions; seventeen of these were on horseshoe kidneys, one in 142.

A knowledge of the stages of embryologic development by which the kidneys are fused permits a better understanding of the pathologic conditions which result in later life.

ANATOMIC STRUCTURE

The accessibility for surgical intervention in horseshoe kidney varies indirectly with the degree of fusion. In most cases the kidneys occupy a position median and caudad to that of normal kidneys. Hill [4] reports the only exception to this; in his case, the kidneys were normally placed. Rokitansky [5] says that the more complete the fusion the lower is the position of the kidneys. The completely fused mass is commonly situated at the promontory, or even in the concavity of the sacrum. In the usual type of horseshoe kidney, the renal masses tend to converge downward and inward, responding to the traction exerted by the commissure on the inferior poles. This is accentuated by the lordosity of the lumbar spine; and not infrequently the superior poles are found to be widely separated. There is also a second abnormal deviation of position; the fusion prevents a complete rotation of the kidney on its vertical axis, leaving the pelvis facing anteriorly. The posterior surface of these kidneys is generally smooth, quite in contrast to the curiously retained markings of fetal lobulation on the anterior surface.

Size and Location.—There is often a marked difference in size between the two lobes. Legueu and Papin [6] collected twenty-seven cases in which the lobes were of unequal size. In twenty-three, the left was the larger, and in four, the right. Watson,[7] Levi [8] and Morley [9] each report cases in which there was almost complete atrophy of one renal mass. The majority of horseshoe kidneys are located in the lower lumbar region; not uncommonly the superior pole is found opposite the second or third lumbar vertebra. Occasionally, there is a tipping of the renal mass so that one kidney is found lying across the spine. Küster [10] cites a case in which the pelvis came directly from the isthmus, the horseshoe mass being turned so that only a small bud of renal tissue remained on the right side. Kidneys fused at their superior poles are higher in the abdomen than those in which the commissure is below. Newman [11] reported a case of fusion of the upper poles in which the isthmus was felt 3 cm. below the ensiform cartilage. At times the entire renal mass is freely movable, but in most cases the isthmus is fixed. Occasionally, the two renal masses may be moved inde-

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* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the authors' reprints.

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6. Legueu, F., and Papin, E.: Le rein en fer à cheval, étude anatomique, pathologique et chirurgicale, Rev. de gynéc. et de chir. abd. **18**: 277-310, 1912.
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8. Levi, M.: Une réunion des deux reins placés au devant de la colonne vertébrale, Bull. et mém. Soc. anat. de Paris **8**: 279-280, 1863.
9. Morley, J.: Case of Papilloma Causing Hydronephrosis in a Horse-Shoe Kidney, Lancet **1**: 1617-1618, 1910.
10. Küster, E.: Die Chirurgie der Nieren der Harnleiter und der Nebennieren, Stuttgart, Enke, 1896-1902.
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pendently. Israel [12] and Paschkis [13] both report instances of a fixed isthmus, but the superior poles were freely movable (Fig. 1).

Pelvis and Ureters.—The pelvis is generally markedly irregular in size and shape, and, with the calices, it is flattened out over an extensive area on the anterior surface of the kidney. In most cases, it is completely extrarenal, markedly deficient, and lacking in the usual support of the enveloping renal tissue. This permits it to dilate readily in response to obstruction and infection. In contrast to this, Robinson [14] cites a case in which the pelvis was completely included in the renal mass, the ureter perforating the parenchyma below. In sixty cases collected by Robinson,[15] the pelves of no two kidneys were alike and often one differed from its mate. Duplication of the pelvis is common. Legueu [6] cites a case in which the pelvis is missing, the ureter opening directly into the individual calices. The calices are generally confined to the middle and upper portions of the renal mass (Fig. 2). However, Israel [12] cites a case in which one of the calices was cut across in resection of the transverse bar.

The high implantation of the ureter and the sharp ureteropelvic angle, which prevent free drainage, are the most common causes of disease in these kidneys. With fusion of the lower poles, the ureters generally pass in front of the isthmus, often in a sulcus between it and the lateral mass. The exposed ureter passes over the solid isthmus, and is easily compressed or distorted by the overlying structures. Landouzy [16] and Durham [17] both report cases in which the ureters passed behind the isthmus. Perruchot [18] reported a case in which the right ureter passed posteriorly and the left anteriorly. Various other ureteral anomalies have been reported. Carlier [3] noted a single ureter which arose directly from the isthmus. Thacher [19] cited the case of an infant with only one pelvis and one ureter. Apert [20] reported a case in which the ureter branched several times before reaching the renal pelvis. Losee [21] found two left ureters running parallel and entering the bladder separately. In most cases, the ureters enter the bladder normally and show very little tendency to become dilated. In contrast to the normal size of the ureter, the dilatation of the renal pelvis indicates obstruction at the ureteropelvic angle.

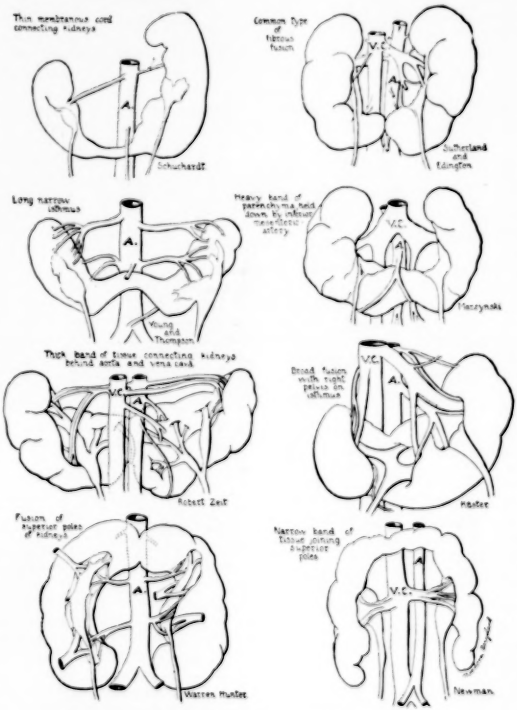
Thin membranous cord connecting kidneys
Schuchardt
Common Type of fibrous fusion
Sutherland and Edington
Long narrow isthmus
Young and Thompson
Heavy band of parenchyma and fibrous tissue, by reflection from dorsal artery
Vaczynski
Thick band of tissue connecting kidneys behind aorta and vena cava
Robert Zeit
Broad fusion with right pelvis in isthmus
Hunter
Fusion of superior poles of kidneys
Warren Hustler
Narrow band of tissue joining superior poles
Newman

Fig. 1.—Horseshoe kidneys, showing variations in structure of isthmus.

Isthmus.—In horseshoe kidney the isthmus is characteristic and may vary from a thin fibrous cord to a solid mass of parenchymatous tissue. Küster [10] cites a case in which the isthmus was represented by a thin fibrous band; Schuchardt [22] notes a similar case in which the kidneys were connected by a membranous cord. On the other hand, Sutherland,[23] Rayer,[24] and Perregaux [25] each cite cases in which the isthmus was of such dimensions as to simulate a third kidney. Magnus [26] found an isthmus 5 cm. broad. In the majority of cases, the commissure is 2 or 3 cm. wide and is composed of solid renal tissue. Often there is a plainly visible sulcus or groove indicating the line of junction of the kidneys. When the isthmus is composed of solid tissue, microscopic sections reveal convoluted tubules and a normal number of glomeruli.

12. Israel, J.: Diagnosen und Operationen, bei verschmolzenen Nieren, Folia urolog. **1**: 617-641, 1908.
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21. Losee, J. R.: Horse-Shoe Kidney with Anomaly of Ureter, Med Rec. **87**: 165, 1915.
22. Schuchardt: Berl. klin. Wchnschr. **29**: 833-834, 1892.
23. Sutherland, L. R., and Edington, G. H.: A Series of Specimens Illustrative of Certain Congenital Affections of the Urinary Apparatus, Glasgow M. J. **49**: 81-105, 1898.
24. Rayer, P. F. O.: Traité des maladies des reins et des alterations de la sécrétion urinaire, Paris, Baillière, 1837-1841.
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26. Magnus, G.: Heminephrektomie bei Halbseitentuberkulose einer Hufeisenniere, Zentralbl. f. Chir. **47**: 76 (Jan. 24) 1920.

Only occasionally, portions of the medulla are seen extending into the fused area.

In the majority of instances, fusion occurs at the inferior poles. Of 262 cases, Beyer [1] found only eighteen in which the commissure connected the superior poles. Renton [27] reported a case in which the connecting link ran from the posterior part of the left kidney, leaving the poles free. In cases of fusion of the inferior poles, the isthmus usually crosses the fourth or fifth lumbar vertebra about the level of the aortic bifurcation, and in the vast majority of cases it passes in front of the great vessels. Nixon [28] reports a case in which the commissure passed between the great vessels and the vertebral column. Carlier says that this is sometimes the case when the renal masses are connected superiorly. Kelly [29] cited a case of this type in a still-born infant.

In most cases, the isthmus is marked by furrows which demarcate its anterior surface from the kidneys. The posterior surface is smooth and generally provides a furrow for the passage of the great vessels. The inferior mesenteric artery usually passes over the isthmus. In a case reported by Edington,[30] it passed through a grove on the anterior surface.

Circulation.—The anomalous blood vessels greatly increase the risk and difficulty of surgical procedures. Israel asserts that the abnormal vascular supply precludes the certainty of pedicle compression for the purpose of performing a bloodless operation on the parenchyma of the kidney. The renal vessels generally follow an oblique course and are markedly irregular in their length and distribution. As in the normal kidney, the renal arteries come from the aorta. The vessels, which are often multiple and above average size, generally occur caudad to the usual attachments.

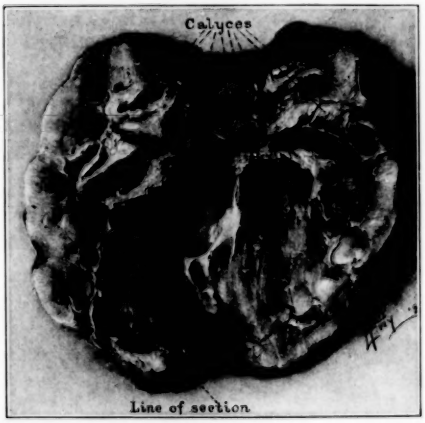

Fig. 2.—Majority of calices at the upper portion of the kidney.

In forty-eight of Robinson's sixty collected cases, the renal arteries were distal to the normal situation. In twenty-five cases, the arteries were multiple or abnormally distributed. In ten, there was a single renal vessel which divided, sending a branch to each lateral mass. In four, there was a single renal trunk to the isthmus which also supplied the kidneys. This is important surgically, as ligation of a vessel with lateral branches would also affect the two kidneys. Bruncher [31] cites a case in which one renal trunk was divided into a series of branches which formed a concave arc of vessels supplying the entire renal mass.

In thirty-three of Beyer's collected cases, there was a special artery of the isthmus. In twenty-nine, the branch was from the aorta below the origin of the inferior mesenteric artery. In several cases, it came directly from the common iliac artery.

Occasionally, the pressure of the isthmus over the great vessels results in thrombosis of the iliac veins. One of Rovsing's [32] patients had phlebitis of both legs. Davidsohn [33] reports the case of a patient with extensive edema of the legs and marked cardiac hypertrophy from compression of both the aorta and the vena cava.

CLINICAL DIAGNOSIS

It may be very difficult to make a clinical diagnosis of fused kidney. It is evident, however, that diagnosis established prior to operation is of distinct material aid to the surgeon. As a general rule, it may be said that in every case of abdominal tumor, a roentgen-ray shadow, or pain adjacent to the umbilical area, should arouse suspicion of the possibility of a fused kidney.

Subjective Symptoms.—When the fused kidney is abnormally low and the diseased renal pelvis lies close to the median line, the radiation of pain will usually be adjacent to the umbilical area and suggestive of horseshoe kidney. The pelvis of one or both segments of the fused kidney, however, is often situated at some distance from the vertebra and may even be found at a normal level. The pain would then be localized in a comparatively normal renal area. Rovsing observed that if a patient is placed in a position in which the curvature of the lumbar spine is increased, or the back muscles made tense, a characteristic pain may be caused which may be relieved by the patient's lying down. This so-called Rovsing sign has not, however, proved to be of much diagnostic value in this series.

Physical Examination.—A fused kidney, unless abnormally enlarged, can seldom be recognized on abdominal palpation. Any tumor involving the median-lying segment of a fused kidney will usually present a mass in the umbilical area. Therefore, in the presence of a mass that is palpable in the middle of the abdomen, the possibility of fused kidney must be considered. Occasionally, with a low-lying fused kidney, a retroperitoneal mass may be felt through the rectum, with the pulsation of adjacent large blood vessels. Fused kidney was observed in several patients with a urinary sinus in the middle of the abdomen anteriorly; these

27. Renton, J. M.: Notes of Two Cases of Horseshoe Kidney, Brit. M. J. **1**: 601-602 (May 1) 1920.
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32. Rovsing, T.: Beitrag zur Symptomatologie, Diagnose und Behandlung der Hufeisenniere, Ztschr. f. Urol. **5**: 586-601, 1911.
33. Davidsohn (quoted by Carlier and Gérard [Footenote 3]): Hufeisenniere, Deutsch. med. Wchnschr. **27**: 111, 1901.

patients had had so-called abdominal abscesses drained elsewhere. Low or median hydronephrotic sacs, or their postoperative anterior sinuses, should lead us to look for further evidence of a fused kidney.

Roentgenographic Data. — The roentgenographic shadow of a fused kidney is usually too indefinite to permit accurate interpretation. Occasionally, the

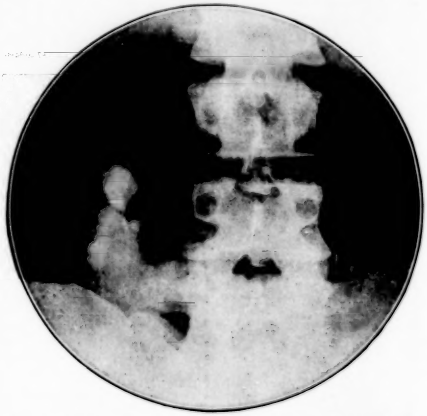

Fig. 3.—Prolongation of the right pelvis of horseshoe kidney toward the midline.

roentgenographic outline of a median mass in a thin subject may be suggestive of fused kidney. With such median line roentgen-ray shadows, abdominal insufflation with oxygen may possibly be of value in the identification of tumors in the middle of the abdomen. In the presence of lithiasis, the resulting shadow may be in a position more median than is usual with renal stone. It has been our experience, however, that a stone in the fused renal pelvis often casts a shadow approximately in the normal position. With multiple stones, the shadows may extend across the vertebrae. Shadows cast by calcified paravertebral glands, low or median lying gallstones, and stone in the upper ureter are most easily confused with those of stone in a fused kidney. If the shadow of a stone lies in an oblique angle and extends toward the median line, as occurred in several cases, it should be regarded as suggestive of fusion.

Cystoscopic Examination.—The position of the ureteral orifice was normal in every case except one. This is in contradistinction to the usually abnormal position of the orifice in duplication of the ureters and pelves. This occurrence would be expected from the embryologic factors involved, since in fused kidney the embryologic anomaly affects the nephrogenic tissue, whereas in duplication of the renal pelvis the ureteral buds are involved.

The data that are usually observed on inspection of accompanying pathologic complications would, of course, be noted. As would be expected, the ureteral catheter can often be inserted only for a short distance, particularly when the pelvis is at a low level. It is not uncommon, however, to find that the usual length of catheter can be inserted, and in a subsequent ureterogram this will be found to be due to the tortuosity of the ureter.

The differential functional test is of much value in determining the possibility of heminephrectomy in cases of fused kidney. It is essential that the function of the remaining segment be ascertained before the other portion is removed, even though the combined function is normal. In two cases, the reflex inhibition of dye secretion resulting from stone, as usually observed in a single kidney, was absent in the fused kidney. Although pyelonephritis, such as may accompany lithiasis, is generally confined to the primary segment, pus may be found in the urine catheterized from the other pelvis, indicating that such infection may spread by direct continuation from one segment to the other. As a rule, however, such infection is confined to the primary segment. This was illustrated by a patient who is alive and well several years after heminephrectomy for tuberculosis in one segment.

Pyelogram.—The roentgenographic catheter may be of considerable diagnostic value and sufficient to identify the presence of renal anomaly. The relative position of the shadows of the two lead catheters introduced into the respective pelves and ureters will often demonstrate the presence of fusion. When one catheter is coiled in the pelvis in the normal position, however, and the other is median and low-lying, other data may be necessary in order to distinguish the fused kidney from a so-called ectopic kidney. When the lead catheter identifies the condition, there may be no object in making a pyelogram. It often happens, however, that the two pelves are approximately normal in position, and further identification will then be necessary. Pyelographic evidence may be the only method whereby fusion can be recognized. Because of the scarcity of

Fig. 4.—Left pelvis of horseshoe kidney, the right pelvis of which is shown in Figure 3.

definite clinical data suggestive of fused kidney, its clinical diagnosis is usually made only in the course of routine pyelography. The characteristic findings are the inverted relative arrangement of the calices and the true pelvis. Instead of lateral extension of the calices, there is torsion of the renal pelvis so that the calices

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extend in a median or cephalad direction. Also the ureteropelvic angle, which is usually median to the pelvic outline, is situated at a lateral angle (Figs. 3 and 4). Therefore, when the pyelo-ureterogram shows evidence of renal torsion, the possibility of fused kidney should always be considered. The identification of shadows and the other findings usually brought out by the pyelogram will also afford diagnostic evidence. When a stone shadow is median to the pelvic outline in the pyelogram, the possibility of fused kidney is suggested. It must be remembered, however, that the usual precautions in pyelography should be doubled in cases of fused kidney. It is well known that any pyelographic medium which cannot drain from a distended pelvis will cause irritation and damage to the renal tissue, unless removed. Therefore, any evidence of retention following the pyelogram should require immediate steps to drain the pelvis either through the ureteral catheter or by surgical procedures (Fig. 5).

REPORT OF CASES

HYDRONEPHROSIS

CASE 1.—Mrs. J. C. McV., aged 41, came to the clinic in April, 1912, because of intermittent left renal colic, frequency, and attacks of hematuria for twenty years.

On physical examination, a mass was found in the lower left abdomen. The roentgen ray revealed a small shadow in the region of the left ureter. Cystoscopy demonstrated a normal right ureteral orifice. The left opening was gaping and eroded, and obstructed a ureteral catheter at 1 cm. from the outlet. The urine from this side was cloudy. A pyelogram of the left side revealed a large hydronephrosis. A diagnosis of left ureteral stone and left hydronephrosis was made.

At operation, the kidney was exposed through an anterior incision. A markedly dilated ureter was found, with a stone in the lower portion corresponding to the roentgen-ray shadow. The stone was forced up to the renal pelvis and ureterectomy performed. The isthmus was excised and the left segment of the kidney, which was almost completely destroyed, was removed through a lumbar incision. The patient recovered rapidly from the operation, and eight years later was perfectly well.

Fig. 5.—Hydronephrotic segment of horseshoe kidney.

CASE 11.—L. W. S., a man, aged 39, came to the clinic, July 20, 1917, on account of attacks of left renal colic. Fourteen years before, he had had fever, with frequency and dysuria for several months.

Roentgen-ray examination revealed a shadow in the left kidney area. On cystoscopic examination, thick pus was seen coming from the left ureteral orifice. Diagnosis of left calcareous pyonephrosis was made.

Through a left lateral incision, a horseshoe kidney was found, with markedly dilated pelvis, containing several stones which were removed through a pelvic incision. Two months later, a left subcapsular nephrectomy was performed. A clamp left on the stump of the isthmus was removed the fifth day. Two years later, during which time the wound had been draining intermittently, a third operation was performed and the renal capsule and upper ureter were removed. The wound healed readily, and three years later, the patient had had no further trouble save an occasional twinge of pain in the left renal area.

SURGICAL PROCEDURES

At operation one may receive the very first intimation that one is dealing with a fused kidney. After the kidney is exposed, it is found not to be so free as usual. In all patients operated on at the clinic, fusion occurred at the lower pole. The upper pole seemed to be lower and farther from the middle line than under normal conditions. As soon as an attempt was made to liberate the lower pole, definite fixation was recognized as being more firm than that due to inflammatory adhesions. When the kidney is lifted forward, the posterior portion is exposed as a smooth surface, and the usual site of the renal pelvis is found to be a continuation of the renal parenchyma, extending as far toward the middle line as the finger can feel. The renal pelvis and vessels are situated anteriorly and a horseshoe kidney is recognized. We have not encountered a case at operation in which fusion occurred at the upper pole entirely. In most of our cases, an isthmus had joined the two lower poles, although in some the isthmus was larger than in others and contained a considerable amount of renal tissue.

It has been suggested that the best exposure in operation on a fused kidney may be obtained by the anterior transperitoneal incision (Rovsing). This is advantageous, because it reveals the portion of the kidney most difficult to deal with, that is, the isthmus. However, there are some objections to this exposure. We often deal with kidneys that are more or less infected, and by employing this method, the peritoneum is exposed to infection. This is not always a serious matter and can often be satisfactorily controlled; however, in some cases it may amount to a very grave disadvantage.

It would be difficult to expose a horseshoe kidney satisfactorily through a posterior incision; but if this type of incision is converted into a posterior lateral incision, the exposure and working field will be just as adequate as with an anterior incision. If necessary, the anterior limb of the posterolateral incision can be carried farther forward than usual, and in this way the isthmus can be exposed to view without opening the peritoneum (Figs. 6 and 7).

If pyelograms were made before operation, in all cases of renal disease, fused kidneys would be recognized from their abnormal location and relationship. Since it is not always advisable or necessary to subject the patient to this procedure, we shall probably always unexpectedly encounter fused kidneys at operation.

If the functional capacity of each of the fused kidneys, and the number and relationship of the ureters to the renal tissue is not known, the question of how to proceed is a very serious one. We must not remove the only good renal tissue, or that which is probably the best. Even by palpating across the median line, it may be difficult to determine whether there is sufficient renal tissue to maintain function. If the exposed kidney is the larger, this may mean that it is hypertrophied from increased function. Furthermore, it may contain the only functioning renal tissue the patient has. In one instance, the surgeon (Judd) was almost too cautious. Although he had not recognized the condition as fused kidney, he decided, after dividing the

ureter, that as he did not know about the function on the opposite side, it would be inadvisable to remove this kidney, although it was badly infected and contained stones. He removed the stones and drained the kidney as well as possible, reuniting the ureter. Convalescence was uneventful, with the exception of a persistent urinary sinus. In the course of a few weeks, it was demonstrated that the patient had a good functioning kidney on the opposite side. As the sinus did not close, the infected kidney was removed. While this necessitated a second operation, it was the safer course to pursue.

In the removal of stones from the pelvis in cases of horseshoe kidney, the approach to the pelvis should be made anterior to the kidney instead of in the usual way. The kidney should be mobilized sufficiently to bring the pelvis into view, but it is not necessary to rotate it forward. The peritoneum is easily reflected. After the stones are removed, it is always advisable to suture the renal pelvis; otherwise urine draining from the anterior pelvis of the kidney could easily extravasate under the peritoneum and might result in considerable infection.

In performing heminephrectomy for infection, multiple stones, or functionless kidney, it may at times be best to perform a subcapsular operation, and tie or suture over the capsule of the isthmus. Unless there is some special reason, it is best to remove the capsule and kidney together. This, of course, is always the rule in the presence of tuberculosis and neoplasms.

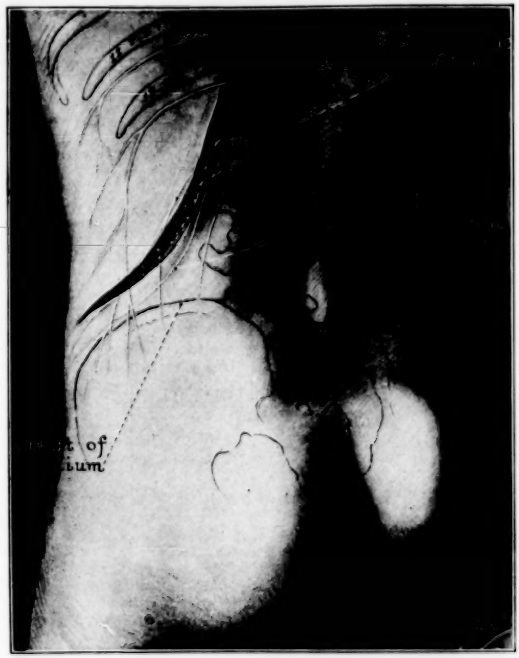

Fig. 6.—Incision for operation on horseshoe kidney and its relation to the nerves and bony structure. The ilio-inguinal and ilio-hypogastric nerves lie in a position that tends to make it easier to retract them posteriorly.

The method of handling the cut-off end of the isthmus will depend on the accessibility and the amount of infection. If possible, the stump should be sutured over to control oozing, and then covered, by bringing the capsule over. If the patient is very large and there is considerable infection, especially if the isthmus is well controlled by a clamp, it is best to leave the clamp in place for several days. It acts as a good drain, and will care for the isthmus very well. During the first few days, the clamp will possibly cause some pain; but otherwise, in our experience, it has made no difference whether we sutured the isthmus or controlled it by clamp.

Surgical operations performed on horseshoe kidneys are more difficult than similar operations on normally placed kidneys, largely because they are less accessible and it is more difficult to see the structures.

The condition is often discovered when it is too late to determine the individual renal function; thus it is difficult to decide on what course to pursue.

SUMMARY

Sixteen cases of horseshoe kidney seen at the Mayo Clinic required operation. In seven there was hydronephrosis; in six of these the diseased segment was removed, and in the seventh the isthmus was divided and the diseased kidney rotated in order to permit the ureter to lie in the normal position. One patient died; the others recovered rapidly from the operation. Four are now perfectly well: one, eight years; one, four years, and two, one year after operation. Two years after operation, one patient was able to work for a living, although she still felt weak.

The formation of stone is common. Eight patients of the series were operated on for renal calculi; most were removed through a lumbar incision. There were no deaths. Three patients are perfectly well: one, five years, and two, two years, after operation. Two patients are in excellent health, but still have occasional dull pain in the lumbar region: one, four years, and one, one year, after operation. One patient was well four months after operation, but the urine still contained pus. One patient, seven months after operation, had not had a recurrence of renal colic, but dysuria and frequency continued. In one case, heminephrectomy for tuberculosis was followed by a good result.

CONCLUSIONS

1. Horseshoe kidneys, a common type of renal anomaly, are more liable to become diseased than are normal kidneys.

2. In most cases, fusion occurs at the lower poles, the connecting link being composed of solid renal tissue.

3. The renal pelves vary markedly in size and shape. In most cases, there is a sharp ureteropelvic angle, and

the insertion of the ureter is too high to permit satisfactory drainage of the renal pelvis.

4. Horseshoe kidneys are well supplied with blood vessels. The arteries and veins are often large and multiple, arise from unusual locations and are markedly irregular in their length and distribution.

5. Obstruction at the ureteral outlet causing dilatation of the renal pelvis is the most common complication.

6. The clinical diagnosis of fused kidney, and particularly the comparative estimate of renal function in the two segments, is of value in determining the surgical indications.

7. In every case of abdominal tumor, a roentgen-ray shadow, or pain referred to the umbilical area, the possible presence of a fused kidney should be considered.

8. Renal torsion, demonstrated in the pyelogram, is suggestive of fused kidney.

9. Operations performed on fused kidneys are more difficult than similar operations on normally placed kidneys, largely because these kidneys are less accessible, and it is more difficult to see the structures.

10. Heminephrectomy is usually possible if the distance separating the two pelves is sufficient, and if the remaining segment functions normally.

11. Probably the most satisfactory exposure is obtained through the Mayo lateral incision.

12. In spite of technical and clinical complications, the results of the operations on fused kidneys have been just as good as similar operations on normally developed kidneys.

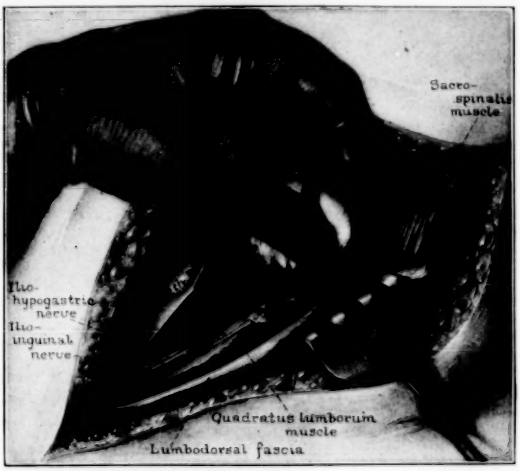

Fig. 7.—Horseshoe kidney brought up into to the wound with great difficuty.

ABSTRACT OF DISCUSSION

DR. HENRY G. BUGBEE, New York: I feel loath to discuss a paper based on more than sixty cases of horseshoe kidney when I have seen but eight, an operative experience based on six cases, my own cases being limited to two. This paper impresses on us the possibility of the occurrence of this anomaly and its surgical importance. I am more and more impressed with the necessity of eliminating the possibility of this anomaly in any case of abdominal tumor, especially when such a mass is located near the median line. Diagnosis is the most important phase of this study. This can seldom be made without a most complete cystoscopic and ureterographic study. The necessity of injecting the ureter and kidney pelvis while the ureteral catheter is being withdrawn is important, that a branching of the ureter between the kidney pelvis and bladder may be detected and a pelvic duplication demonstrated, which might easily be overlooked. We are all aware of the importance of poor drainage as a predisposing factor in pathologic conditions of the kidney. A malplaced kidney or ureter is more often subject to pressure than the normally placed and conformed organ, and interference with drainage in such cases is a common occurrence. While the large percentage of fused kidneys observed may be the seat of an infection that will not necessitate operative interference, yet the possibility of one part of a fused kidney harboring a tuberculous process, a pyonephrotic sac, a new growth or calculus must be borne in mind, and one's operative technic governed by the knowledge that we are dealing with a single organ, conservation of kidney tissue being important. I have removed one half of a fused kidney (heminephrectomy) for tuberculosis which was limited to the area drained by one pelvis, and a calculus from one pelvis of a second horseshoe kidney. In two cases, a horseshoe kidney was detected in pregnant women. In both cases, the kidney was placed at the pelvic brim, causing obstruction to normal delivery and necessitating cesarean section.

DR. HERMAN L. KRETSCHMER, Chicago: The important point in these cases, as Dr. Judd said, is diagnosis. The diagnosis can often be made from the pyelographic findings and the peculiar position of the renal pelves and calices. I believe that if it were possible to obtain clear kidney pictures in every case, we might be in a position to make the diagnosis before operation more frequently. That this is possible was recently demonstrated to me by Dr. Potter, who was able to show the outline of a horseshoe kidney in the roentgenogram made with his diaphragm.

DR. BENJAMIN S. BARRINGER, New York: I wonder whether Dr. Judd has used air inflation of the peritoneum to make the diagnosis. I do not believe that this method is established yet as a safe and sane method of making the diagnosis before operation.

DR. L. T. LEWALD, New York: In relation to what Dr. Barringer has just said, this method of perirenal inflation, according to Carrelli, offers a very good chance for a correct diagnosis in this anomaly. In his series of 250 cases, Carrelli had no horseshoe kidney to record; but I believe that the method should be utilized in the suspected cases and that it would give an absolute diagnosis.

DR. CLARENCE G. BANDLER, New York: I should like to record, in view of what Dr. LeWald has just said, one case of horseshoe kidney which we were able to diagnose by means of the Carrelli inflation method. We have been employing this method in a few cases and as yet we have had no trouble. I was rather encouraged by the work of Carrelli, I had the opportunity of being with him for some time, and trouble did not seem to be a part of his difficulties at any time. I have never seen such wonderful pictures. He did not happen to have any cases of horseshoe kidney to demonstrate, but he had so many roentgenograms of suprarenal glands, clearly depicted, that I do not doubt that he will encounter a horseshoe kidney.

DR. E. S. JUDD, Rochester, Minn.: I believe that the difficult point is that we probably will always be confronted with

this unexpected encounter with horseshoe kidney. We will make the diagnosis of the renal condition all right, but we will not make a diagnosis of the fact that one kidney is fused to the other.

THE PATHOLOGY OF HYPERTENSION *

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When we speak of the pathology of a disease, we imply that an alteration in organic structure brings about changes in function which constitute the clinical aspects of the disease. In recent years, the inadequacy of pathology to explain alterations in function in certain morbid states has made many observers skeptical of this relationship. An association of a definite lesion with certain clinical phenomena does not necessarily imply that the lesion was the cause of the symptoms. The lesion may represent merely an end-product of the pathologic conditions that resulted primarily in functional changes which were the first discoverable symptoms of the malady.

This is the problem that confronts us in discussing the pathology of hypertension. For years, the association of arteriosclerosis and nephritis in patients dying of hypertension led many to believe that these lesions were the cause of the increased blood pressure. Many theories were proposed and much experimental work was instituted to explain this causal relationship, but a sound mechanistic explanation is still lacking. This belief was weakened still more by observations of (1) profound arteriosclerosis and nephritis found at necropsy without hypertension being present during life, a condition to which the term decrescent was applied by Allbutt; (2) patients with hypertension, even of a considerable degree, but who at necropsy presented only slight changes in the vascular and renal systems, certainly not sufficient to account for the hypertension during life, and (3) the almost constant lack of any proportion between the degree and extent of the lesions and the degree of the hypertension.

A new aspect was furnished by a clinical observation that repeatedly came to notice. A routine examination, perhaps because of slight disability, may reveal that a person has nothing but a hypertension. This is the condition which Allbutt years ago called hyperpiesis and Huchard presclerosis and which is now conventionally termed essential hypertension. If these patients are observed for a period of years, other evidences of disease arise, such as albuminuria, nocturia, ventricular hypertrophy, evidences of gradual thickening and tortuosity of the superficial vessels, and changes in the retina; profound changes in the function of the renal, and especially of the vascular systems and, ultimately, death.

Then various clinical concepts arose for a group of diseases to which the term cardiovascular-renal is applicable: general arteriosclerosis, localized arteriosclerosis (coronary disease), aortitis, cerebral arteriosclerosis, mesenteric arteriosclerosis, and chronic nephritis with or without uremia. Here was a disease in which a primary disorder of function, namely, hypertension, remained more or less constant or, at least, did not increase in proportion to the other signs of disease, and ended in profound anatomic changes in the cardiac, vascular and renal systems.

We can state the sequence of events only when we have observed the development of changes from the very beginning; but, unfortunately, as a rule, we see our patients in the middle or advanced stages, when evidences of an anatomic damage are only too manifest.

HYPERTENSION AND ANATOMIC CHANGES

Other evidences, especially the rapidly accumulating data which reveal a causal relationship of hypertension to arteriosclerosis, led to the suspicion that hypertension may bring about anatomic changes. Some of these have been admirably set forth by Allbutt [1] and by Faber.[2]

The more important evidences were the following: 1. Arteriosclerosis is most prominent in those portions of the vascular system in which the stress is greatest, at bifurcations and at points of narrowing, whether normal or abnormal. 2. In cases of congenital stenosis of the isthmus of the aorta, there is always a profound sclerosis of the proximal part of the aorta and at the site of the stenosis, while the peripheral portions of the aorta show little or no sclerosis. In these cases most observers have noted also a marked sclerosis and tortuosity of the vessels that maintain the collateral circulation, namely, the internal mammary, the scapular and the vertebral arteries. The same is true in pulmonary stenosis. 3. Marchand [3] found no arteriosclerosis in the arteries of an extremity paralyzed because of poliomyelitis, when there were marked changes in the healthy limb. 4. The endocardium in the left auricle is thickened excessively in mitral stenosis. 5. The endocardial and subendocardial thickenings of the left ventricle in patients with hypertension have been recently described again by Hertel.[4] 6. Arteriosclerosis is usually more prominent in those vessels which are unsupported, for instance, the basal arteries of the brain, the coronary and the temporal arteries, and the aorta; but it is less prominent in vessels that are supported by muscular tissue, as in the extremities. 7. Harvey [5] produced arteriosclerosis in the aorta by digital compression for many days, and Klotz [6] obtained similar results by suspending rabbits in the inverted position for a prolonged period. 8. Carrel [7] found that a section of vein sutured between the divided ends of an artery rapidly showed sclerotic changes. In this instance, every factor except the effect of pressure can be excluded. 10. Observations on arteriosclerosis of the lesser circulation prove the effect of increased pressure in bringing about an arteriosclerosis. It is remarkable that arteriosclerosis of the pulmonary arteries occurs only in those conditions in which an increased intrapulmonary tension is obviously present, namely, emphysema and, especially, mitral stenosis. My studies of the pulmonary vessels in patients having mitral disease reveal a striking disproportion between the profound sclerosis of the pulmonary vessels and the relatively slight sclerosis in the aorta. In these patients, the smaller vessels and the capillaries of the alveoli reveal interesting changes which I shall discuss more fully. 11. Arteriosclerosis

* Read before the Section on Internal Medicine, Academy of Medicine, New York, May 16, 1922.
* From the First Medical Service, Mount Sinai Hospital (Dr. N. E. Brill), and the Pathological Laboratory, Beth Israel Hospital.

1. Allbutt: Diseases of the Arteries, London, 1915.
2. Faber: Die Arteriosklerose, Jena, 1912.
3. Marchand: Verhandl. d. Cong. f. inn. Med. **21**: 23, 1904.
4. Hertel: Frankfurt. Ztschr. f. Path. **14**, 1920.
5. Harvey: Virchows Arch. f. path. Anat. **196**: 303, 1909.
6. Klotz: Zentralb. f. allg. Path. u. path. Anat. **19**: 535 1908.
7. Carrel: Bull. Johns Hopkins Hosp. **18**: 18, 1907.

of the retinal vessels occurs only in those conditions in which a hypertension is or has been present. 12. Certain negative evidences may be set forth: (*a*) Sclerosis is relatively absent in the veins in which pressures are low. On the other hand, in veins in which the pressure is increased, as in varicosities or in an arteriovenous aneurysm, sclerosis is present. (*b*) Extensive or profound arteriosclerosis is infrequent in patients who have hypotonia, as tuberculosis. (*c*) Arteriosclerosis, as a rule, is less profound in women than in men. These evidences certainly show that hypertension should be considered as a factor, perhaps the most important, in producing arteriosclerosis.

In what manner hypertension causes the anatomic changes characterized by the term arteriosclerosis we do not know. I believe the explanation is partly mechanical and partly compensatory. Certainly, many of the changes can be accounted for by a mechanical stretching of the tissues with replacement fibrosis and, eventually, hyalinization and calcification. The thickening of the intima, hypertrophy of the media, and increase in the elastic fibers, are probably in a great measure compensatory.

Fig. 1.—Section of lung, in long standing case of mitral stenosis, showing enormous thickening and sclerosis of arterioles with increase of interstitial tissue, and reversion of alveolus to embryonal type; arteriocapillary fibrosis.

In the last year, I have seen an unusual number of patients in the hospital suffering from typical glomerulonephritis following throat infections. At the outset, the pressure is increased, usually from 170 to 180 systolic and from 100 to 120 diastolic; there is more or less edema and oliguria and marked albuminuria. In one or two patients uremic symptoms have appeared. Although the patients are always young, between 15 and 30, the radial arteries are so thickened and tortuous that a diagnosis of juvenile arteriosclerosis has been made. Under treatment, the symptoms subside and the blood pressure falls. The remarkable thing is that, as the blood pressure falls, the artery becomes appreciably softer and less tortuous, and evidently the feel of the artery becomes normal. That the sensation of thickening is not entirely due to the hypertension is shown by the fact that the thickness and tortuosity do not return to normal until a month or two after the tension has become normal. My explanation is that there is a hypertrophy of the median muscular coat, compensatory to the hypertension, analogous to the hypertrophy of the ventricle, and that this hypertrophy is restored to normal when the hypertension disappears. This accords somewhat with the view of Schlayer,[8] who states that it is not the intimal changes that make an artery palpable, but the functional changes in the media which may not even be visible anatomically.

This is not the occasion to enter too greatly into the pathologic anatomy of arteriosclerosis. As MacCallum[9] makes evident, the subject is surrounded by immense difficulties because of a host of conflicting views. Neither the histology of the lesions nor the sequence in which they appear is at all a settled subject. For practical purposes it seems sufficient to recognize, with Marchand, that arteriosclerosis represents all those changes which result in a thickening of the vessels. The distribution of these thickenings in various parts of the vascular system is more important than the question as to whether they are the result of changes in the intima, media or adventitia, or whether these changes represent fatty degeneration, sclerosis and calcification.

The conventional view is that arteriosclerosis is a malady confined to the larger trunks of the vascular system, and that palpation of the radial artery affords an excellent guide to the degree of the involvement. It does not require extensive correlation of clinical signs and morbid anatomy to prove that this is not always true. In the first place, while arteriosclerosis when present is usually fairly well distributed throughout the body, it is not uncommon that the process is more intense in one or more segments of the arterial system than in others. Sometimes the brunt of the injury falls on the cerebral or the coronary arteries, the aorta or the abdominal arteries, or on one or more combinations. Why this should be so we do not know. In the second place, it is not at all unusual to find advanced sclerotic changes in the terminal portions of the vascular system, with comparatively few and superficial lesions in the main trunks. It is on these cases, which indeed are common, that Jores has laid so much stress; the recognition and interpretation of these lesions mean much in the explanation of the

8. Schlayer: Deutsch. Arch. f. klin. Med. **98**: 164.
9. MacCallum, W. G.: Physiol. Rev. **2**: 70 (Jan.) 1922.

genesis of vascular lesions. Clinically also these cases are important, because, as I have demonstrated in a recent paper, they cannot be differentiated from the syndrome which we have been wont to recognize as true renal disease.

HYPERTENSION AND RENAL LESIONS

The frequent association of certain renal lesions with hypertension led to the deduction that these lesions were the cause of hypertension. Soon observations accumulated which could not be thus interpreted: 1. Hypertension was noted during life in persons whose kidneys showed minimal lesions—were practically normal. These patients did show, however, a marked arteriosclerosis of the terminal vessels, not only in the kidney but also in other parenchymatous organs. I reported five such cases, observed in little more than a year, with limited facilities; so that such cases are by no means rare. 2. Profound disease of the kidneys, so-called contracted kidneys, are found at necropsy although no hypertension was present during life. Such disease also is common, and from its analogy to decrescent arteriosclerosis has been designated as "decrescent" kidneys. 3. That the degree of hypertension bears no relation whatever to the amount of renal damage found at necropsy is a corollary of the previous statements. This observation, readily affirmed by even the most superficial attempt to correlate clinical with necropsy findings, is sufficient, it would seem, to discourage any attempt to discover that will-o'-the-wisp, a pressor substance in the damaged renal parenchyma.

How may we reconcile these contradictions? First, they prove that we may be in error when we say that hypertension is caused by renal injury, or the group of injuries termed chronic interstitial nephritis. Secondly, they show that whatever the cause of the hypertension may be, the end-result was either an arteriosclerosis of the terminal arteries, including those within the kidney, or a damage of the kidney parenchyma itself in variable proportions. Study of the lesions of those kidneys associated with hypertension reveals that a single pathogenesis, namely, a primary disease of the vascular content of the organ, explains all of them. The interpretation that all the lesions of the kidney in chronic interstitial nephritis may be the direct result of injury to the vascular supply is certainly legitimate. The thickening of the glomerular epithelium, the fibrosis, hyalinization and, perhaps, calcification of the glomerular tufts, represent an arteriosclerosis in miniature. The profound disease of the terminal arteries entering the glomerular tufts, the vasa recti, and the proximal branches of the renal artery within the fatty portion of the pelvis, are constant findings. The greater or lesser destruction of the epithelial content of the organ is explainable partly by the diminished vascular supply of the tissues, even, partly, by compensation hyperplasia, and complete absence in parts, due to closure of a vessel, with replacement fibrosis, which, as in any organ, leads eventually to contraction. In this light, the kidney in chronic interstitial nephritis may be considered an organ consisting of epithelial tubules enmeshed in the interstices of an extensive vascular framework. When disease of the latter occurs, the tubular portions necessarily disintegrate.

An organ in which these changes occur varies in morphology according to the senescence of the process. If the person dies in the earlier stages, a circumstance not unusual as the result of pure circulatory failure, we find a kidney with minimal lesions or with moderate fibrosis, affording the picture connoted as "finely granular kidney." Such kidneys are not appreciably smaller than normal. The "red" which is frequently prefixed to this designation is due in largest part to a venous congestion caused by circulatory failure. If the person dies in the middle stage of the malady, the kidneys are more coarsely granular and much smaller than normal, and compensatory hyperplasia is more in evidence. Microscopically, there is greater aging of fibrous transformation with narrowing of the cortex, and fatty replacement in the hilum is apparent. Finally, if the patient lives long enough, the progression of the lesions results in what is termed the "secondary contracted kidney"; the senescence of all the pathologic elements reaches its maximum, a veritable scar, and it is the only pathologic kidney we have described which may be properly termed an end-product; the others are merely intermediary stages.

The entire process may be likened to the changes witnessed in a granuloma, which indeed, in the strict sense of the word, the lesions of chronic interstitial nephritis represent, and the resulting changes are in no way different from those seen in a granulomatous transformation of any organ—the ovary, for instance.

Recognition of the progression of lesions will, I believe, help much to eliminate the current confusion in regard to so-called "types" of kidney. We speak of the "large granular kidney," the "small granular kidney" and the "contracted kidney" as though each represented end-reactions. In consequence, many classifications are in vogue, most of which have simply made "confusion worse confounded." A differentiation into types would be understandable; if the types could be strictly defined in the biologic sense; but this, it is acknowledged, is almost impossible since transitions from one to the other are frequent.

The kidney lesion is associated with hypertension only in chronic interstitial nephritis. No other variety of chronic inflammation of the kidney is associated with hypertension, whether it is the parenchymatous which, incidentally, is exceedingly rare, the amyloid, the kidney of subacute bacterial endocarditis, or any destruction of the kidney parenchyma from whatever cause.

CAUSE OF THE RENAL LESION

What is the cause of the renal lesion? In my opinion, the lesions of the kidney in chronic interstitial nephritis present a form of local arteriosclerosis involving not only the smaller and larger arteries but also, to a greater or lesser extent, the capillary tufts of the glomeruli. Some lesions of the vascular system of the kidney are practically constant in hypertensive disease, in which arteriosclerosis is present not only in the kidney but also throughout all the organs supplied by the greater circulation, as Jores and his pupils have demonstrated: in the skin, spleen, pancreas, brain, heart, eye and other organs. If it is not visible to any great extent in the main arterial trunks; it is almost always seen in the terminal arterioles. The kidney in chronic interstitial nephritis, therefore, represents merely the localized expression, perhaps the most prominent, of a generalized arteriosclerosis. Moreover, we must assume, because of the constant presence of the glomerular lesions, that this sclerosis affects not only the arteries but also the capillaries.

Sclerotic changes in blood vessels are not limited to the arteries, but involve the entire vascular system,

including the capillaries and the endocardium. The conception of a capillary sclerosis is not new; it is merely a revival of a conception broached by former pathologists. That the capillaries are involved in organs other than the kidney is difficult to prove by the ordinary histologic methods, because sclerosis of an isolated capillary is almost impossible to demonstrate. However, where capillaries are arranged in bundles or tufts, as in the glomeruli and in the islands of Langerhans, sclerotic changes are readily demonstrable. In the islands, sclerosis is a not uncommon accompaniment of hypertensive disease, accounting perhaps for the frequent association with diabetes. Capillaroscopy best demonstrates the presence of a generalized capillary sclerosis in hypertensive disease. By this method, tortuous, deformed and irregular capillaries are found almost invariably when hypertension is present. Whether the sclerosis begins in the capillaries or in the terminal arterioles cannot be determined. Probably the sclerosis arises in all parts of the vascular system simultaneously.

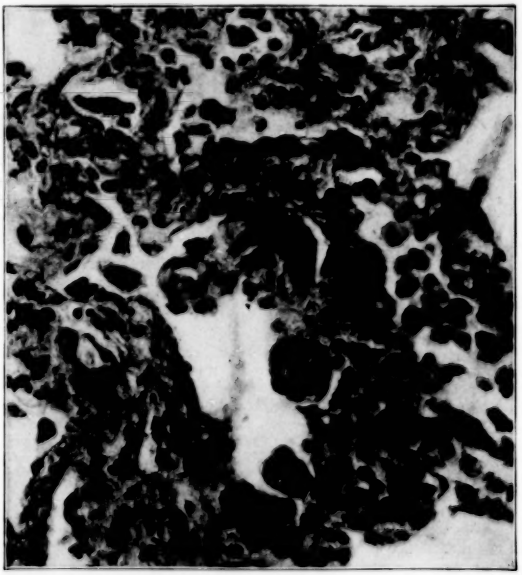

Fig. 2.—High power section of the lung, in a long standing case of mitral stenosis, showing profound thickening of the alveolar capillaries and increase in interstitial connective tissue; arteriocapillary fibrosis.

For these reasons, the term "arteriocapillary fibrosis," first employed by Gull and Sutton in a different connotation, seems more appropriate than terms in current use. With this conception, a syllogism enters the argument: (*a*) Hypertension is an important, if not the most important, factor in producing the lesions of arteriosclerosis. (*b*) Arteriosclerosis and arteriocapillary fibrosis of the kidney are one and the same lesion and are always associated. (*c*) Therefore, hypertension is the most prominent cause of arteriocapillary fibrosis of the kidney. The arterial and renal lesions, then, are not separate and distinct entities and do not bear mutual reactions to each other, but are the simultaneous resultants of the same insult.

This conclusion can be fortified by a number of interesting observations:

1. Changes in the background of the eye always follow a long standing hypertension and are never seen unless hypertension is or has been present. These changes, according to all descriptions, are the precise analogues of those seen in arteriocapillary fibrosis. If, therefore, these changes follow hypertension, it seems reasonable to conclude that the associated analogue of this lesion is the result of the same cause. It would be interesting to note whether the retinal and the renal changes parallel each other in intensity. I know of no studies in which this question has been investigated.

2. Sclerosis of the larger pulmonary vessels is invariably associated with increased vascular tension in the lesser circulation, caused by mitral stenosis, for instance. The contrast between the extent of the sclerosis in the greater and lesser circulatory systems is most striking, especially in younger subjects, and affords a strong argument against the thesis that a general toxin, an infection, for instance, causes arteriosclerosis. The interesting point is this: If the hypertension can cause sclerosis of the larger pulmonary vessels, we must presume, if our argument concerning fibrosis of the capillaries is valid, that arteriocapillary fibrosis of the lung does occasionally occur. This, indeed, is a fact. From studies thus far uncompleted, I can say that in cases of mitral stenosis of long standing, lesions of the lung are found that can be interpreted, according to all morphologic criteria, as arteriocapillary fibrosis. These lesions are termed, in textbooks, "fibrous induration of heart disease" or "Stauungsinduration" (Figs. 1 and 2).

3. These observations fulfil the expectations based on hypothesis. If hypertension is primary and arteriocapillary fibrosis of the kidney is secondary, it would seem important to discover what pathologic changes occur when an artificial hypertension of pure mechanical nature is induced by increasing the peripheral resistance. Nature has performed this experiment in the congenital narrowing of the blood vessels, a well known anomaly in the necropsy room, described by numerous writers. The anomaly is supposed to predispose the individual to numerous maladies, but this is doubted in a recent monograph by Kaufman. There is considerable literature and abundant testimony concerning the not uncommon association of renal lesions typical of arteriocapillary fibrosis with congenital aplasia of the blood vessels. The observation that the association is usually found in young nephritics is largely the result of the labors of Lancereaux,[10] Bezançon,[11] Mosgofian[12] and Chiaruttini.[13]

10. Lancereaux: Leçons de clinique médicales, Paris, 1894.
11. Bezançon: D'une néphrite liée à l'aplasie artérielle, Paris, 1889.
12. Mosgofian: Thèse, Paris, 1893.
13. Chiaruttini: Clin. Med. Ital. **37**: 686, 1898.

Opportunity is afforded for speculation as to whether, after all, the cause of the puzzling nephritis in young persons is not a congenital vascular malformation.

Other observers and I have seen that arteriosclerosis and nephritis occasionally follow another form of congenital increase in peripheral resistance, namely, congenital narrowing of the aortic isthmus.

CAUSE OF HYPERTENSION

The cause of hypertension itself is unknown. I have elsewhere described a type of individual with certain physical and, especially, psychic characteristics, in whom hypertension is very prone to occur.

The proponents of the primary renal origin of hypertension are in the habit of citing the effects of a primary scarlatinal nephritis on blood pressure. A scarlatinal nephritis, which is most often an acute glomerulonephritis, heals in the clinical sense and leaves little or no trace of the damage that has been done. We are told that this nephritis remains dormant for a varying period of years, say from ten to twenty, and that in adult life the nephritis becomes evident again and affords the clinical aspects of the chronic variety, with hypertension and other symptoms. This belief seems untenable in view of the fact that there is no instance in all pathology of an infection which has ceased to act initiating an inflammation which is progressive in character. When the insult is over, there is a *restitutio ad integram*, a healed lesion or death.

Since we are not often in the position to follow the end-results of certain diseases, I was interested to know what happened to patients with scarlatinal nephritis after many years of observation. Duyvis [14] studied thirty patients who had had scarlatinal nephritis sixteen years previously. All were well. A few showed traces of albumin in the urine. The significant thing is this: A glomerulonephritis is a productive inflammation and, when such an inflammation heals, there can be no complete *restitutio ad integram*. We must therefore assume that a glomerulonephritis from scarlatina must leave some scar in the kidney, the nature of which we do not know. Granting that such a kidney may be predisposed to a subsequent chronic inflammation, it is quite different to say that the lesion is the cause of a chronic nephritis.

I have not observed the disease for a sufficiently long period to be able to say whether or not all varieties of primary hypertensions eventually lead to arteriocapillary fibrosis. Certainly there is a great difference in the time of onset of the clinical evidences of the cardiovascular-renal syndrome after the hypertension has been discovered. In some patients it occurs within a year or two. In others the syndrome has not yet appeared even after observation of five or more years, especially in cases of so-called hypertension of the menopause, some of which are associated with mild evidence of exophthalmic goiter or autonomic imbalance. Perhaps the explanation lies in a different tissue resistance of the vascular organs or, as Osler calls it, "bad tubing." What part the endocrine organs play is entirely speculative.

How we are to account for the lesions of decrescent arteriosclerosis and decrescent nephritis, which is usually found in persons past 55 and in which hypertension is not associated, has been discussed in a previous paper. The prominence of hypertension as a clinical symptom should not make us forget that, after all, hypertension is merely an exaggerated phase of tension, and it is this element which by some is called wear and tear. Our vessels are constantly under tension, and there is no reason why changes in the expansion and contraction of vessels extending over a great many years should not cause changes similar to those induced by hypertension. We presume that, when hypertension is present, the changes occur sooner and are not accompanied by those compensatory changes witnessed in patients with the decrescent lesion. In recent years there has been a growing tendency to regard the lesions of the decrescent kidney or its synonyms, the arteriosclerotic and the primary contracted kidney, as identical with those of the secondary contracted kidney.

41 West Eighty-Third Street.

14. Duyvis, M. A.: Scarlatinal Nephritis, Nederlandsch. Tijdschr. v. Geneesk. **2**: 1339 (Nov. 1) 1919; abstr. J. A. M. A. **74**: 570 (Feb. 21) 1920.

CERTAIN DYSKINESIAS IRREMEDIABLE BY OPERATIVE OR PROSTHETIC MEASURES

THE PATHOGEN AND THE MANAGEMENT *

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WASHINGTON, D. C.

That abnormal movements or attitudes can occur apart from focal destruction or irritation of tissue is denied by those whose thinking has been circumscribed by too exclusive a study of lesional interpretation. There are still a few reactionaries, unable to think in terms of modification of function, who maintain that what are known as the psychoneuroses arise from physical alterations as such, even if these be only hereditarily derived tendencies of the neural protoplasm. Their argument is not purely *a priori*, but is based on instances in which the dealing with a physical state has restored to health an individual whose disease was regarded as a disorder of function merely; but it is surprising that the same observers ignore the still more numerous instances in which health is restored by purely psychic means to patients whose disorders have been erroneously attributed to physical agencies. Of these, the dyskinesias of which I am to speak are a striking example.

When a surgeon encounters a deviation of the neck without ankylosis or fibrous contracture, the temptation is very great to attribute the muscular contraction to an overexcitation of the nerve supply of an unknown nature. His purview may even reach the cortex cerebri, and he may attribute the contraction to an activation of the neck-moving neurons in the third frontal convolution. But further than this he rarely attempts to think. The natural bent of his training driving him to deal with effects rather than causes, he is strongly tempted to cut the spinal accessory nerve; and this has often been done, with the quiet neglect of the fact that other muscles than the sternocleidomastoid and the trapezius are concerned in the rotation of the neck, and that to be logical the operation would have to comprise the cutting of all the nerves of the cervical plexus also. This, of course, abolishes the twisting of the patient's neck, but only at the price of its paralysis.

* Read before the Section on Orthopedic Surgery at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

Far better, then, to seek for and deal with the cause if possible. The imaginer in lesions would then be tempted to proceed to the cerebrum and perhaps expose the rolandic area in the hope of removing an irritation as hypothetic as the supposed irritation of peripheral nerve or spinal center. But for the serious consequences of radical operations of this kind, and but for the relative unfamiliarity of surgeons with nerve and brain surgery, these mystic operations would have been more often undertaken.

To contractures of the arms, legs and spine, to orbicular spasm, to facial twitching and contortions of the body, the same reflections apply. One could formulate a classification of the dyskinesias of each region from an anatomic point of view. Were the source of the movements local, this would be profitable; but as the pathogen is not local, and as the anatomic relations are therapeutically unimportant, this classification is not only unscientific but misleading.

LESIONAL DISTURBANCES OF MOTILITY

Dyskinesias, like other diseases, should be classified pathogenically. We must exclude from the category of dyskinesia the aberrant movements already designated by the terms paralysis, such as poliomyelitis, neuritis, Sydenham's and Huntington's chorea, hemiplegia, facial palsy, paralysis agitans, encephalitis and the consequences of syphilitic invasions; and we must exclude also the restriction or amplification of movement by alteration of the connective or muscular tissues. All of these have a definite lesional pathology of comparatively simple mechanism which does not require discussion here.

Fig. 1.—Torticollis after encephalitis, possibly a true spasm from central lesion. (From photograph supplied by Dr. S. P. Goodhart of New York.)

Forced movements are not infrequent sequences of encephalitis; in some cases they have persisted to date, and it is highly probable that they will be permanent, as they are due to lesions. Although the best known type closely resembles the movements of paralysis agitans, other types are not infrequent. Among these are rhythmic jerkings of the limbs, body or neck. The latter by mere inspection are sometimes indistinguishable from those of the torticollis which Brissaud called mental. They differ in several important particulars, however, more particularly in that they are not controllable volitionally; they are usually highly rhythmic, often with a definite time period; they may persist during sleep, and they are unaccompanied by anxiety or distress other than the unpleasantness which is inevitable (Fig. 1). They are not of the nature of purposive or adaptive movements, even though, like tic, they may be increased by excitement, emotion or during observation. Physical signs are often altered. This is never the case in pure tic. Lastly, the movements cannot be controlled by psychologic devices of the patient, and they are unamenable to psychotherapy. In some instances they may be attenuated by depressants which usually aggravate the true tic.

VARIETIES

There are two varieties of dyskinesias other than the foregoing:

1. *Of Chemical Origin.*—These are aberrant movements due to the direct irritation of nerve structure by chemicals. They can be readily demonstrated in the laboratory, although clinically they are not only rare but difficult to establish except by inference. The convulsive movements provoked by absinthe furnish an example, and perhaps those of epileptics belong to this category also. In orbicular spasm, periodicity is dependent on chemical or vascular variations in the medullary center or facial nerve as it passes through the aqueduct. This is purely inferential, however. Some kinds of singultus may be assumed to arise chemically, as they are provoked by ingestion of food and are removed by drugs.

In this category may be included the reflex spasms, for they are provoked by a peripheral irritation which modifies the chemistry of the receptors and induces the kind of reactions we call reflex. Such are blepharospasm, some forms of vomiting and hiccup, and perhaps some of the jerkings and wrigglings (more usually included among the tics) in which the real incitant is a state of local tissue uneasiness, such as may be provoked by a mild arthritis, pleurisy or even by a skin irritation, such as the wearing of uncomfortable clothing. Any of these may provoke a reacting movement against the discomfort, which will cease when the local irritation is done away with. Strictly speaking, the mechanism in the latter is neither chemical nor reflex in its entirety, for the integrations through which it is performed comprise cerebral activity, intention, consciousness and volition.

2. *Of Psychic Origin.*—These are nowadays termed tic, which is defined as an integrated movement (or attitude) performed by the patient at first intentionally, but which later becomes a habit against which he may struggle, and giving rise to distress, on account of struggle to overcome it, as well as from pain caused by the muscular contractions, or because of the shame felt at being observed to assume attitudes or make movements which seem purposeless and eccentric. While the dyskinesia often gets the better of the patient, he can temporarily succeed in completely controlling it by a special effort. Moreover, the movements can be suppressed or modified by various devices which affect the patient's attention or feelings. For instance, a turning of the head may be arrested by touching the chin with the finger. A forcible closing of the eyelids may be forestalled by dropping the jaw or looking upward, by wrinkling of the forehead, or even by whistling. A cramping of the hand on writing may be obviated by placing the pen in an unusual position, as under the crooked finger, by turning the hand to the ulnar side, or by complete change of writing style. None of these expedients remain efficacious for long, the dyskinesia getting the better of them in each turn, until the person may become incapacitated for writing, from keeping open the eyes, or even from using knife and fork, on account of the extreme turning of the head and the participation of the shoulder and arm in the movement, as the case may be.

Dyskinesias of this kind may cease for a time through the distraction of the attention. In some instances the dyskinesia is provoked only on the contemplation of a particular act. This is more especially the case in occupational dyskinesias (cramp of

writers, musicians or telegraphers, in some of the cases to follow).

In all dyskinesias of this variety, the emotivity of the patient is disturbed, and not only in consequence of the incapacity. The cases to be related will show the part played by emotion in the genesis of the condition. A study of these cases will make it clear that their mechanism has nothing to do with special chemistry or peripheral reflexes, and that the problem is of the kind we call psychopathologic; that is to say, it has to do with the integration in an unfavorable way of those impulses and activities which depend on perception and cognition of a situation which is unpleasant, and to which the patient reacts as a whole intentionally in the first place, by the kind of attitudes and movements which we choose to call dyskinesias, and which superficially may resemble attitudes and movements created by lesions or chemical stimuli, but which differ from them essentially in genesis, in character and in therapeutic requirements as set forth in the accompanying table.

DYSKINESIAS

Spasm	Tic	Chorea	Cerebellar and Cerebello-rubrospinal Tremor
Sudden, resembling electrical stimulation	Brusk and brief, slower	Still slower	Not sudden, but regular and increased by movement
Rhythmic and synchronous or in lightening waves of same movement	In volleys of similar movement repeatedly	Irregular, not synchronous	
	When tonic, distinguished from stereotyped act by absence of catatonic attitude	Extreme variability in movement with tendency to unilaterality	Similar oscillations
Muscle often enfeebled	No weakness; often hyperkinetic hypertrophy	Myasthenia, hypotonia	Myasthenia, hypotonia or the reverse
Modification of reflexes concerned only	Reflexes normal	Reflexes often modified	Reflexes increased
Distribution of peripheral nerve	Locally conditioned by an idea	Usually bilaterally	Laterality or not
Often painful, always distressing; no craving	Painless	Sometimes painful	Never painful
Persisting in, and may interrupt, sleep	Tic disappears in sleep	Sleep interfered with	Disappears in sleep
Purposeless	Pseudocoordinate, intentional act	Purposeless	Purposeless
Irreproducible voluntarily unmodified by volition or emotion	Influenced by emotion or volition, but impulsive and followed by satisfaction, always arrestable (leaving no trace) by a subterfuge, a neutralizing act ineffaceious mechanically or physically but effective psychically; also variously by solitude, distraction, position, etc.	Uncontrollable by will, aggravated by emotion	Cease at rest
Various etiology, but generally peripheral irritation, e. g., trigeminal neuralgia (which is not a true tic)	Psychasthenic character, similar heredity, but always first generated by a determining stimulus; it is the sequel to the unhindered repetition of a once voluntary purposive act, becoming an impulsive obsession	Acute rheumatic diathesis, probably bacterial; no similar heredity	Various, neoplasm

DISTINCTION FROM MANNERISMS, AND GESTURAL AND ATTITUDINAL HABITS

A few words must be said of the difference between habitual gestures and attitudes and the true tics. The former occur in perfectly normal individuals as well as in the insane, in whom they are called stereotypies. Examples in the normal are stroking of the mustache, wrinkling of the brow, whistling, playing with the watch chain, grimacing of the face, waving the hand, or sawing the air while speaking. So long as these are unconscious automatisms, and so long as they could be prevented without suffering, by a little care on the part of the performer, they do not merit the name of habit spasm, nor can they be classed with the tics.

CHARACTER OF THE TICS

The tics are convulsive and intemperate in character, are accompanied by consciousness of the act, are preceded by a desire sometimes amounting to a passion to perform the act, and are followed by a feeling of relief after performance of the movement. At all events, the victim of tics feels compelled to make the movement comprising the tic; hence the term impulsion or compulsion neurosis. The movements always represent, however, incompletely, some voluntary act, e. g., turning the head, wrinkling the nose, shrugging the shoulders, biting the cheek, blinking the eye, sniffing, or jerking a limb. The end to which the movement was first directed has, however, often passed from the recollection of the patient; and the act itself has often degenerated into a caricature of what it originally was. A simple example is a winking of the eyes, which has continued for years in spite of the fact that the irritation of the foreign body which first excited it has long subsided. It often originates in an idea which ultimately becomes ignored or forgotten by the patient, such as in Case 7.

TWO CLASSES OF TIC

1. *The Hysterical.*—In hypersuggestible persons tics are easily induced, sometimes make little impression on the patient, and are very simply removed by reeducation and persuasion or even by suggestion. These we call hysterical.

Disorders of gait and station independent of lesions or physical disease have been well known to neurologists for many years, but their significance was not generally grasped until the Great War revealed them in thousands. Thereby orthopedic surgeons gained an insight into psychologic mechanism; but it was very difficult not to regard a disorder of gait as lesional while lesions stared one in the face, even though these were not responsible for the dyskinesia.

A striking instance is afforded in Case 1.

Case 1.—*Psychic dyskinesia of locomotion.* In this man an enormous loss of tissue had impaired the efficiency of the quadriceps femoris. It could have been speciously inferred that the dropping gait, with extreme flexion of the knee when he threw his weight on the injured member, was due to lack of extensor power; but a careful study of the poses proves that this is not the reason (Fig. 2). A man whose leg bent in walking as much as this because of a weak quadriceps would

fall; for a leg which cannot be held extended at an oblique angle has even less power of extension when the knee is more acutely flexed. Hence the dyskinesia of the man has a psychologic source, and by a maneuver which distracted the man's attention from the act of leg extension, we were able to prove that the muscle could extend the leg quite well.

Thousands of like cases were successfully dealt with during and after the war by psychotherapy irrespective of whether the men were deliberately malingering or merely the victims of wrong ways of thinking about their impotences[1] (Figs. 3 and 4).

Unfortunately, there were also thousands of cases in which contact with medical and surgical ways of thinking served to maintain the belief of the men that their dyskinesias were of physical causation. It was the old story of the traumatic neurosis with the modification of a new setting. It took a long time for psychiatric conceptions to pervade the surgeons sufficiently to enable them to prevent the cultivation of "hospital" dyskinesias. In spite of all the experience of the war, this often happens even now.[2]

Fig. 2 (Case 1).—Dyskinesic gait not due to lesion of muscle in front of the thigh.

CASE 2.—*Suggestion of medical origin as the pathogenic factor.* Perhaps the most striking example that I have seen is that of a man in whom a dyskinesia of the orbicularis palpebrarum occurred as a result of conjunctival irritation due to driving on dusty roads in summer, while short of sleep because of conviviality. The protective closing of the lids became a habit. Even though a predisposition to this tic was revealed by the shoulder and face tics early in life, the palpebral dyskinesia might have receded as spontaneously as did the other tics but for its fortification by the frequent repetition of medical opinions expressed before him for six weeks by distinguished men in a famous hospital nearby. As it was, the therapeutic problem had become most difficult, and the secret of its solution lay in the avoidance of further examination which would focus attention on the possibility of physical interpretation. This precaution permitted the reeducational procedures to take hold of the patient, so that in ten days he was able to go about alone, although he had been completely incapable of doing so for seven months.

CASE 3.—*Dyskinesia of the abdominal muscles cured by psychomotor discipline.* A striking case was that of a man referred by an enterologist because of a grunting noise which he made with respiration, while at the same time he bent his body in a bowing tic. Physicians had recognized its functional character and had used electricity and other methods of suggestion without success. I observed that sudden contractions of the rectus muscles and diaphragm occurred, and inferred that if the patient could be taught control of these muscles, the movements would necessarily cease. He was shown how to perform contraction of the recti and diaphragm, and that when he was voluntarily moving his abdominal muscles he could not perform the bowing tic; and that when he voluntarily contracted the diaphragm he could not make the grunting noise. He was cured in two sittings.[3]

CASE 4.—A similar case was observed in a woman patient referred by Dr. E. E. Mayer of Pittsburgh. The same procedure cured her in one interview without reference to the etiologic factor, which consisted of a domestic quarrel, the elements of which were adjusted with her afterward.

CASE 5.—*Iliopsoas spasm (psychogenic) consequent on appendicitis.* Another patient seen with Dr. I. S. Stone had persistent pain after appendectomy because of a constant reference by the patient to the region formerly painful, which produced a spasm of the iliopsoas and oblique abdominal muscles. Reeducation in relaxation of muscles in general, and then of those affected, was the treatment.[4]

CASE 6.—*Torticollis removed in ten days.* Again, a Russian boy, aged 11, declared that ever since the age of 5 he had felt the need of periodically turning his head abruptly to the right every few minutes. He experienced no desire to do this, but he never attempted to inhibit the movement, and performed it at least every few minutes. He gave himself no opportunity to develop angoisse. He presented no other neuropathic stigmas, not having scruples, timidities, aboulias or feelings of inadequacy, morbid fears or monomanias, although he occasionally indulged in day-dreams—but what boy of his age does not? The movements were short, yet not "electric," but they often occurred in volleys. They were such as could be reproduced volitionally. They were painless, and disappeared with sleep. However, no conditioning idea could be elicited, and he was entirely unaware how he began the movement, saying, "It just comes." The movements were more numerous when he was perturbed, and had never been influenced by any neutralizing subterfuges, none having been tried. They consisted of sudden turning of the chin over the right shoulder, sometimes accompanied by its elevation and that of the shoulder, and a twitching of the face, more especially the lips.

It is evident that the spinal accessory nerve alone could not perform such a movement, and it is inconceivable that a local irritation could comprise the facial nerve, the spinal accessory and all the nerves of the cervical plexus without having some effect on contiguous structures and implicating the phrenic nerve as well. It must, therefore, be cerebral.

The question whether focal or psychic was answered by the test of voluntary inhibition of the movements, and I found

1. Williams, T. A.: Management of Hysteria in War, Mil. Surgeon **45**: 549 (Nov.) 1919.

2. Williams, T. A.: National Morale in Relation to Hysteria, Military and Industrial, Tr. Am. Medico-Psychological Assn., 1919; New York M. J. **112**: 436 (Sept. 25) 1920.

3. Patient exhibited before the Medical Society of the District of Columbia: M. Ann., 1910.

4. Williams, T. A.: Surg., Gynec. & Obst., January, 1912.

that by maintaining the attention of the patient firmly to follow with his eyes the movements of my slowly moving finger, fixing it intently and vividly, I was able entirely to suppress the movement, first for a space of thirty seconds, and later for periods of increasing duration I then impressed on him the power of his own will in suppressing the movements; and he was ordered to come to the dispensary every day for treatment, which consisted of the psychomotor discipline of fixing with his eyes slowly moving and stationary points for longer and longer periods under the supervision of two of the students in the dispensary. He supplemented

Fig. 3.—Position of feet of a soldier in the field who had dyskinesic station and gait. Its psychologic nature was demonstrated by its rapid removal by intensive persuasion after orthopedic and suggestive measures had been of no avail for months.

this by similar exercises at home, and at the end of ten days the tic was under such control that he made the movement only twice daily, later recovering completely (1908).

2. *The Psychasthenic Tic.*—The tic, on the other hand, which is preceded by an imperative longing, the struggle against which causes intense suffering, occurs in overscrupulous individuals of little suggestibility, whom Janet has called psychasthenics, and who show numerous stigmas of their constitution in addition to the tics for which they may seek advice.

CASE 7.—*Torticollis traced to emotional stresses.* E. L., a single woman, aged 31, who was employed as an expert counter in the U. S. treasury, was unable to use the right arm, for each motion caused the head to turn to the right, and she was compelled to look backward with a most powerful force, over which she had no control. The trouble began three months before with a pain behind the right shoulder, running round to the right side. She now had pain all the time. She consulted a physician, who called it neuritis and advised massage. The nurse who was called feared to massage her; so electricity [sic] was tried, and did good at first to both the pain and the movements.

Three months before the tic there had occurred a serious unpleasantness with a comrade in the office, whom she stigmatized as an ignorant, conscienceless woman. There was great emotional bitterness displayed during the patient's account.

She brooded deeply over this episode, and as her work in counting can be performed quite automatically, her thoughts were free all day long to dwell on the constant unpleasantness of being in the same room as the other woman, who sat behind her on the right.

It was evident that the girl's thoughts about her enemy caused her head to veer and turn toward the place where she knew her to be. This was the less easy to resist because her attention was partly occupied by the counting of the money, which was her duty. As she was anxious to do this as rapidly and well as possible, mistakes or insufficient work not being condoned, she was less able to resist the motor response to her underlying thought, which was essentially a desire for an understanding with the other woman and a reconstruction of her own desire to be in harmony with her surroundings.

However, by a process of psychologic substitution, the need of turning the head had come to accompany every use of the right hand, so that she was unable to use her knife at the table without a turning of the head and an ensuing rigidity of the arm and head in the effort to arrest the torticollis and accomplish the act she wished. In writing, the same thing occurred.

The case affords also an example of occupational cramp mechanically produced by torticollis of mental origin, which by a psychologic association had in turn become producible by any use of the hand and arm.

The cause of pain was the action of the muscles antagonistic to the turning movement, which the patient consciously sought to prevent. Between the automatic desire to turn the head and the conscious effort not to do so, the muscles of the shoulder, neck and upper part of the chest were maintained more or less constantly in a state of powerful contraction; and this severe drag on their attachments, combined with a state of fatigue, provoked the pain of which the patient complained. It is similar to the pain caused by the carrying of a heavy bag for a long while.

Even at rest, the patient held the head somewhat to the right, and kept contracted the neck and shoulder muscles on that side.

Had the mental groundwork of this patient been different, it was unlikely that the incident would have occurred. That mental groundwork was made up by the unfortunate life of the patient's mother, which had led the daughter to take an attitude on the part of her family which made harmonious intercourse with other people quite difficult. In the proverb of the street, she went through life with a chip on her shoulder.

OCCUPATIONAL DYSKINESIA

CASE 8.—*Writers' cramp.* A single woman, aged 29, was referred, April 10, 1910, by an orthopedic surgeon, after the failure of orthopedics and massage to improve an incapacity to write, apparently due to a painful stiffness and cramp of the shoulder and wrist of two years' duration. Several months in the country had also failed to remedy the cramp, although he had gained 10 pounds (4.5 kg.) in weight and become much stronger.

Fig. 4.—Position of feet after treatment.

When, in the act of writing, the wrist stiffened, the forefinger and thumb tightened up on the pen, the hand trembled, and the patient complained of severe pain in the wrist and between the first and second metacarpal bones.

Psychologically she was overconscientious and inclined to melancholy.

She was employed as bookkeeper in a railroad office, and on returning to work after influenza, she had great difficulty in finishing the day. She felt that this position must be kept, as she could no longer, by singing, earn the money she needed to support herself, as she had formerly done. Against the increasing difficulty of writing her daily quota, she struggled hard; but anxiety only added to the physical

burden, and she finally succumbed after trying various methods of holding the pen in the effort to write. This process occupied about six months, and ended in a tremor so violent that she had to be fed. She attributed her incapacity to a broken muscle in the shoulder, and hoped that a month's rest would enable her to return to work. This belief was largely the fruit of medical opinion, showing the need for psychopathologic skill in a variety of conditions common in medical practice.

After a month's treatment she greatly improved, but was very pessimistic, and thought she had a tapeworm because of her ravenous appetite.

After the first eight weeks I did not see her so often, and she unfortunately relapsed on account of frequent discussions of her state by well meaning friends, so that toward the end of July she was firmly impressed with the idea that there was a deformity in the hand and shoulder. This was disproved with some difficulty, as her attitude was distinctly contrary. But after this she fell back on the notion that she needed something to make her food assimilate. A rediscussion of her digestive difficulties showed her that they were caused by her emotions.

In spite of all reasoning to the contrary, she declared that she could feel her hand contract sometimes, even when not writing. I decided, therefore, that she had not a real grasp of the principles I had been trying to inculcate. One is likely to fail to carry the patient along in understanding unless the temptation to go rapidly without sounding the patient all the way is not succumbed to. Accordingly, I recapitulated them systematically, with great care, and wrote out a summary for her to take home and study. After her next visit, I kept this, and asked her to write to me an account of the mechanism of her condition as she understood it. This account disclosed that she had not even yet transcended the physical explanation, as she referred her condition to disease of the brain cells, failing entirely to appreciate that her disability was psychologic; that is, a disharmony of acts arising in ideas. It was as though on a typewriter neither broken nor worn, when one wrote the wrong letters were brought into operation. It would not be possible to overcome the abnormal acts derived from diseased brain cells by any amount of studied indifference or exercise of self-will, which would serve in a psychologic situation.

The patient's own explanation of the mechanism of her affection showed that she had by no means an adequate conception of her own condition, as she believed that the brain cells were diseased. As it was necessary for her recovery that she should have a clear understanding, I again tried to place before her that which it was necessary for her to comprehend, and to eradicate from her mind her erroneous ideas about herself, as follows: First, it is an error to say that your "brain cells have become diseased." There is no disease of your cells: there is a disorder only of the harmony of action among them in writing, etc. This originated in the extraordinary efforts to accomplish much during a time of fatigue and mental distress. It was the difficulty of doing this which caused the unusual attitude of the hand, which arose from conscious effort to perform what was beyond your staying power. The tightening of the muscles was "mental." The habit of wrong writing was thus engendered, and it is this which now persists as an automatism. That is to say, when you are not paying attention, the hand of itself is guided by the mind unconsciously into these perverted positions. But even when attending, there is an inclination to fall into the very position you desire to avoid. This is partly due to its habitualness and partly to the natural tendency of many persons to perform the very act they most wish to avoid; a familiar example is of the cyclist to collide with the obstruction he sees in the road. By practice, this tendency is soon overcome. So you see that the abnormal acts are not the result of disease of the cells; but are merely bad habits to be overcome in the same way as those of the learning of the piano or of any act needing mechanical dexterity.

It was only after this that rapid improvement occurred and that the writing, though a little large, became normal. Perfect ease, however, was not attained, although she did a good deal of clerical work intermittently, and was ready to take a position demanding it continuously, knowing that if the right hand failed, the left hand, with which she had learnt to write, could take its place.

As a result, one year later she was in better physical condition than she had been for years, and was able to walk long distances and to do hard housework without fatigue, whereas formerly she was tired out by walking a few squares or by any hard work. But that the restoration of her physical health was not the cause of her partial recovery from writing cramp is proved by the relapse of the latter, in spite of continued improvement of her physique. This relapse was due to circumstances which compelled the cessation of the reeducative training.

The patient, however, has remained for ten years in important clerical positions.

The dyskinesia of the patient was the product of fear of failing to perform the work required and hold her position. She had long previously developed singers' cramp, owing to embarrassment when she sang a solo. This had been induced by remarks on her appearance by an anonymous correspondent. No attempt was made to deal with this, as she was content to sing in the chorus, which caused her no embarrassment. The most important feature of this patient's dyskinesias was their etiology, which was a defect of character making her prone to shame. Space will not permit a detailed description of this, or of the individual steps by which she was adjusted to satisfactory economic efficiency and effective contentment, in which the dealing with the dyskinesia was not the major element; for she remained happy and efficient, although she found it preferable to do most of her writing with her left hand. The case, however, is an excellent example of psychogenic dyskinesia and its cure.

It will be observed that in both these cases the term tic has been applied to a dyskinesia concerned with the patient's occupation. While it is a more precise term than merely neurosis, it may surprise because of its association with conditions that do not arise in connection with occupational activity. But I have shown elsewhere [5] that the occupational act cannot be performed because the muscles that perform it are occupied with the tic movement, and the tic movement is a reaction to the idea of beginning or continuing the occupational act. It is a discordance rearoused by the mechanism of association. Of this the following case is an extraordinarily striking example:

CASE 9.—*Writers' cramp.* A man referred by Dr. Williams of Boston had been unable for one month to write his name clearly on account of a tremor. We know that tremor is a symptom of toxemia or of nervous disease; but this man could draw without trembling, which he could not do if his neurons were diseased or intoxicated, so we concluded that his tremor was psychogenic. Analysis revealed that the first time he trembled was when he returned to work after a surgical operation before he was fit. The bank did not recognize his signature, and apprehension of this caused him to tremble thereafter when attempting to write. Reeducation led to his cure in a month after one visit.

The rôle of mental prepossession inhibiting the due coordination of muscular movements was explained to him and illustrated by means of the strokes in lawn tennis, more especially that known as the drive. It was shown that fear of making an improper stroke is very likely to lead to lack of freedom and cramping of the muscles, which is the very position to be avoided. Still greater anxiety will create an uncertain, wobbling stroke, the incoordination of which is comparable to his writing.

The relationship of these facts to the episode of the refused check was discussed with him at length. When he had clearly realized the psychologic mechanism of his condition, he was directed entirely to cease writing with purpose, and to begin exercise with free-arm movements with chalk on a

5. Williams, T. A.: Studies of the Genesis of the "Cramp" of Writers, Telegraphers, etc.: The Treatment Made Possible by This Research, J. f. Psychol. u. Neurol., 1911-1912.

blackboard, paying attention to the forms he drew, but concentrating himself on the attainment of freedom in action. When this was insured, he might pass to a slate, and later to pencil and paper, and gradually reduce the size of the writing. But over two years later he sent me a specimen and informed me that he had almost entirely recovered after one month of the exercise prescribed.[6]

THE RÔLE OF PHYSICAL INADEQUACIES

Psychic inadequacy to a situation is the real pathogen of the tics. This is the case even when physical inadequacies are the basis of this; for it is because of the incapacity of his function that the patient cannot succeed in adapting. In these cases, however, it is not by an intensive psychotherapy that adaptation is to be sought, but by an improvement of the bodily state, after which adaptation will be spontaneous unless maladjustments have become habitual. For example:

Case 10.—A child, aged 11, was brought to me ten years ago because of forced movements of the face. Psychomotor discipline only aggravated the movements, besides creating resentment. The movements were merely one of the reactions of an inadequacy due to endocrine unbalance. The other signs were mental sluggishness, with narcolepsy, adiposis, hypotrichosis and increased sugar tolerance.

The inadequacies due to these physical conditions expressed themselves in the unusual behavior of fibbing, deceitfulness, evasions of duty and the tic before mentioned. After hypophysial feeding compensated the inadequacy of the pituitary gland, the forced movements and other psychic consequences disappeared in a few months and had not recurred ten years later.

Case 11.—An only child, a third grade lad aged 11 who had not gone to school until 8, was referred to me by Dr. and Mrs. Cary Grayson, in November, 1921, because of blinking and grimacing since the age of 5. He had begun to shoot his cuffs at the age of 6. A former head shaking, shoulder shrugging had ceased for two years, but the head still nodded. He had been a nail biter and would cough before speaking, and latterly his eyes began to blink and roll. In spite of all this he was active in play, interested in school, well nourished and ate and slept well. Any of these movements could be stopped at will, but, boy-like, he would forget.

In a case of multiple tics of this kind, a constitutional state may often be incriminated. A lymphatic appearance, and overstoutness, were all that could be found in this case. Because of this he was given pituitary gland. But the morbid gesturing was a habit for which restraining was necessary; hence a series of exercises in inhibitions were begun so that at the end of a week the boy was capable of remaining motionless 600 seconds in full control of the blinking and eye rolling tic which was the direct cause of his being brought to me, as it had interfered with his book work at school.

In addition to this, recommendations in mental hygiene were given to the mother, a good sensible country woman, so that the patient has been able to proceed quite satisfactorily with his school work for six months.

THERAPEUTIC PRINCIPLES

It should be apparent from the perusal of these illustrations that dyskinesia cannot profitably be treated as such by rule. It is the inadequacy of which it is an expresion which must be aimed at. Whether this is a neurologic lesion or whether it is a chemical disturbance, or whether it is a reaction to circumstance purely psychic, the etiologic factor, broadly speaking, must be ascertained. The problem is often a subtle one. And in the psychogenic case the adaptation of means of control to the particular issue is essential to successful treatment. The cases have shown how in some instances direct control may be gained by kinetic education which enables the patient to deal readily with forced movements which are mere perpetuation by habit of a reaction the causes for which have ceased to be operative, whereas in other instances it is necessary to deal with a specific psychic situation in order to change the mental attitude of the patient toward that. In still other instances, it is a life attitude which is concerned, and a radical reeducation of the patient is required.

1746 K Street.

6. Williams, T. A.: New York M. J., March, 1911.

ABSTRACT OF DISCUSSION

Dr. Hugh T. Patrick, Chicago: If I properly interpreted this presentation, it is a sort of admonition to the surgeon not to operate on these patients and not to treat them by apparatus. Apparently, the attitude of the surgeons in my part of the country is different from that of the surgeons in Dr. Williams' district; for, so far as I know, our surgeons are not operating for tic, writers' cramp, or things of that sort. It may be that once in a while they are tempted to operate on spasmodic torticollis. Perhaps I could add to Dr. Williams' admonition to these gentlemen to keep their hands off. Tic is a poor name for a condition for which we have no better name. It is more than a habit, and less than a spasm. Some of these cases are exceedingly refractory, and some are merely temporary. If refractory, why is it so? If one can answer the question "Why is a confirmed habit refractory?" one can tell why a tic is rebellious. If a man has a vicious habit which cannot be corrected, it is because there is a defect in that man's character. Such a man fundamentally does not wish it to be corrected for some reason which may not be apparent to us or to himself, but which is there just the same. This applies in a general way to refractory tic. To illustrate what tic is: For many years in the street car which carried him and me uptown and downtown, I observed the antics of a real artist who painted good pictures. Constantly he jerked and twitched hands, fingers, arms, shoulders or head. But none of these bizarre movements ever misdirected the stroke of his brush. Spasmodic torticollis is the worst kind of tic, if it is a tic. In this disorder the patient has what Brissaud called a restraining gesture. The most striking example I have seen was in a powerful man whose head twisted to the left with irresistible force. At the height of the spasm, when he could not possibly force the head into a natural position, if he approached the extended left forefinger horizontally toward the nose, just before the finger reached the nose the head would smoothly rotate to the right into a normal position. If by any stretch of imagination a disorder of that kind can be attributed to some perverted action of the nerves supplying the sternocleidomastoid muscle, I should like to know what it may be. That disorder is exactly what Brissaud called it—mental torticollis. It has no more to do with the anatomic structures of the neck than have the anatomic structures of lips and tongue to do with the violent oaths which some men use. To cure profanity, one might as well operate on the lips as to operate on any particular anatomic structure in the neck to cure spasmodic torticollis. I have never seen a case cured or much helped by operation. I had a few patients operated on by the old Keen method without any benefit.

Dr. M. S. Henderson, Rochester, Minn.: Dr. Rosenow took material from the tonsils of patients who came in with spasmodic torticollis, and injected it into rabbits. In quite a number of rabbits, he produced spasmodic torticollis. One rabbit had it so extremely that his head was almost turned upside down by the action of the muscles. I gathered from Dr. Williams' paper that he was emphasizing the functional side of this condition. I bring this point forward merely to show that sometimes, at least, spasmodic torticollis is due to organic disease.

Dr. Tom A. Williams, Washington, D. C.: I have gone at considerable length into the discussion of those symptoms due to lesions and also those due to chemical disturbances

besides those of mental torticollis. There are cases caused by lesions in the striate apparatus. They are to be found abundantly in postencephalitic dystonias. Many patients with encephalitis have dyskinesias. Those are due to distinct lesions which can be demonstrated postmortem. The paper discussed especially the states which Dr. Patrick so beautifully illustrated when he said, illustrating the return of the twisted neck, by means of the approach of the forefinger, "What is the pathology of that?" It is a psychic pathology. Many of these movements (those we term psychasthenic movements) are influenced by psychologic means. It is true that many of these tics are incurable by our present means, because they are incorporated into the personality. In them the tic is the patient's life, so to speak; without it he is lost. Unless one can change that patient's whole attitude of looking at things, one cannot cure the tic. Those are the difficult cases spoken of in the last paragraph of my paper. Most cases are not so difficult and they can be cured, some by changing the patient's attitude to life, some by a series of exercises. The question arises in cases of tic as to the physician's personality. It is a great trouble to correct the condition in some patients. I myself cannot do it in cases of long standing. Some men can. What I read the paper for was not so much to draw attention to the inadvisability of operating in cases of torticollis as to call attention to other dyskinesias, writers' and other cramps of occupation and the like, which are fundamentally psychogenic, tics, and to which the same principles apply as those which we have tried to speak of in torticollis. The cases which are cured by operation can be cured more easily another way. When surgical measures do by chance cure the patient, it is not the operation, but the suggestion given thereby which affects the patient. Such patients can easily be cured in the same way as the cases I described, sometimes in one interview, by changing the patient's attitude toward his disability. These are the cases that are not difficult. In the difficult cases, it is a question of whether to undertake treatment or to leave them as they are.

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TREATMENT OF INDUSTRIAL ACCIDENTS TO THE KNEE-JOINT*

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Injuries to the knee resulting from industrial accidents comprise practically all types of traumatic lesions except gunshot wounds, and these have their counterpart in penetrating and lacerating wounds not infrequently encountered. Therefore the valuable lessons of the World War in knee surgery are largely applicable here and should be generally understood and practiced in this branch of civil surgery, and the problem of function, as well as of healing, should be kept constantly in the minds of those having the management of these cases.

It appears that in many quarters there is still serious disregard or ignorance of many of the special points in diagnosis and treatment of knee injuries, which are so essential if these patients are to be back on the job in the shortest possible time with the least possible disability. This problem became one of great importance during the war, and its solution, chiefly by the British orthopedic surgeons under the leadership of Sir Robert Jones,[1] forms a notable chapter in the history of military surgery.

A thorough knowledge of the complex anatomy and function of the joint is a sine qua non. There is a close analogy between the abdomen and the knee in many respects, and those who undertake knee cases should learn to make a careful and thorough study of the knee and to recognize the many special points relating to its numerous structures, just as they would make in intra-abdominal conditions before arriving at conclusions as to diagnosis and treatment. Likewise, a carefully and wisely taken history may be even more important than the physical examination, though, of course, both are important. Contrary to former belief, the knee joint cavity has almost if not as great a natural resistance to infection as the abdomen, an important difference being that the latter has greater capacity for localizing any infection that may occur. Neither cavity can be effectively drained by tubes or wicks, a fact that explains the serious results in septic knees. Furthermore, the knee may be affected by a considerable variety of lesions, and it is sometimes difficult or impossible to make an exact diagnosis; exploratory arthrotomy is occasionally justifiable, as is exploratory laparotomy.

These points of similarity are mentioned to emphasize the importance and scope of knee surgery. Practically, it is a very distinct field demanding special training and experience. The after-care of these cases, with their complex problems of splinting and the tedious details of physical therapy, is even more important than the operative procedures in many of them, so far as restoration of function is concerned. Certainly no surgeon without special training in this field of very technical work and the necessary equipment, including a closely supervised physical therapy department, can get the best results in these or other joint cases. The insurance companies are slowly but surely beginning to recognize the economic value of such specialized treatment.

SOME PRACTICAL POINTS IN THE MORE COMMON TYPES OF INJURIES

So-called sprains or synovitis of the knee are very frequent. No knee injury, however insignificant it may appear at first, should be treated as such until after a careful search for a definite injury to the internal lateral ligament, semilunar cartilages, postpatellar fat pads, tibial tubercle and spine, crucial ligaments, patellar ligament, etc. Failure to recognize any of these at first may make a vast difference in the result. In simple traumatic synovitis without definite injury to other structures, I am convinced that the best treatment, in those cases showing enough fluid to float the patella, is completely to immobilize the joint for from five to ten days. A light plaster cast gives most perfect rest. It should be split down each side to make the front half removable so that radiant heat and graduated contractions of the quadriceps femoris by the Bristow coil can be carried out daily. The cast is held together by adhesive plaster the remainder of the time. A posterior gutter splint serves the purposes not quite so well. After removal of cast or splint, heat, contractions by the Bristow coil and graduated movements are continued daily, until the cure is complete, usually only a few days. This method gives the advantage of rest to the joint without muscle atrophy from disuse, which meets the objections raised by some against splinting these joints. I have used the popular compression and exercise method, but it has not proved so effective, nor does it seem rational. Rest of acutely inflamed tissues

* Read before the Section on Orthopedic Surgery at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. Jones, Robert: Derangements of the Knee, Ann. Surg. **1**: 969, 1909; Lancet **2**: 297, 1914; Injuries to Joints, London, Oxford University Press, 1917, pp. 144-164; Military Orthopedics, London, Cassell & Co., 1917, pp. 96-109.

is still the great aid to healing. An apparent exception to this is in the Willems treatment of septic joints, but here drainage is the paramount issue, and it is best obtained by active movements, the minor evil effects of motion having to be disregarded.

In subacute or chronic synovitis, the acute cases in which recovery does not occur after a few weeks should be handled the same way, but the fixation being continued for three or four weeks. If there is thickening and repeated pinching of the postpatellar fat pads, the muscular contractions of the quadriceps should not be carried out until this swelling has subsided and the splint is removed, then the foregoing physical therapy should be used.

Injuries to the semilunar cartilages are an interesting class of cases, now more frequently recognized in this country than formerly, though still often overlooked. Very little can be added to the classical papers of several years ago by Jones,[1] Morison,[2] Martin [3] and Corner.[4] A safe rule to follow, when these cases are seen soon after the injury, is, first, to be certain that the torn part has been reduced to its normal position, as evidenced by ability fully and freely to extend the knee, then immobilizing completely in full extension (not hyperextension) for four weeks. If reduction is impossible after repeated gentle manipulations of the proper kind, first without, then with, an anesthetic, the cartilage should be excised after a week or ten days of rest for subsidence of acute symptoms. If it has remained unreduced for a month or more, or if there is repeated displacement and locking, then it should be excised. After operation, the case should be treated as an acute traumatic synovitis, as described above.

In cases without the classical locking but with a sensation of something slipping or giving way in the joint at time of injury, it is safer to treat this as a cartilage case. It may save future trouble and an operation, if treated this way at first. If seen later with persistent symptoms, not positive, the same fixation and physiotherapy treatment should be tried for a few weeks. If symptoms still persist and a loose cartilage seems the most probable cause, then it may be justifiable to do an exploratory arthrotomy. I would hesitate to operate on a patient with a history of chronic arthritis preceding the cartilage injury. In cases of long duration since first injury, there may be a chronic thickening of the synovia which may retard or prevent a cure from operation. I have had two such cases in my series of nearly fifty operations.

The Jones technic is the classical one for operation. I wish to suggest a small modification which has aided me materially in avoiding scratching or cutting the articular cartilage or synovia. Instead of the usual straight bistoury to separate and sever the cartilage, I use narrow bladed, blunt pointed scissors, curved on the flat, such as the Mayo dissecting type; this also facilitates the operation.

Rupture of the internal lateral ligament often results in serious instability, discomfort and permanent disability. At the time of injury and for some time after, it is evidenced by localized tenderness, pain on forced abduction, and lateral mobility of the extended knee. The intimately attached internal cartilage is also often disturbed. If locking has occurred at the time of injury, the limb should be immobilized in practically full extension in order to fix the cartilage in place. However, as the internal lateral ligament is on tension when the knee is fully extended, it would seem best to relieve this tension slightly during healing by at least avoiding hyperextension, which is so often produced when a plaster cast is applied while the limb is being supported by the foot. If the cartilage was not displaced, it is better to immobilize with the knee flexed about 30 degrees, for the same reason that one everts the foot in a sprained ankle with rupture of the external lateral ligament of the ankle. For chronic relaxation or separation of the ligament, several operations have been devised, such as shortening or suture, and replacement by a band of fascia lata or the sartorius tendon. These will be rarely needed if the flexed position is maintained after the injury to allow healing without tension on the torn ligament.

It may be stated here that relaxed knees following prolonged traction and immobilization for other injuries to the limb may be very largely prevented by keeping the knee slightly flexed. If a Thomas splint is used, it is an easy matter to bend slightly the rods opposite the knee.

Rupture of the crucial ligaments, usually only the anterior one, is the result of more severe trauma than that causing the preceding conditions, though they may be associated. There may be a fracture of the articular portion of the tibia or the femur which may obscure the diagnosis. It is always present in dislocations of the knee joint. If the anterior crucial ligament is ruptured, manipulation will show abnormal forward sliding of the tibia on the femur with the knee fully extended. If the posterior crucial ligament is ruptured, there will be backward sliding, more particularly with the knee in flexion, though Walton [5] has shown that both crucial ligaments are tightened when the knee is fully extended. Forced hyperextension of the knee would cause a rupture of one or both ligaments, more often the anterior, together with a tearing of the posterior ligament of the knee and probably part or all of the internal lateral. Severe lateral strain, especially abduction of the leg, may also be a cause. The rational and usually satisfactory treatment is to immobilize the joint in about 30 degrees of flexion. This position keeps all the torn structures relaxed during healing. A knee brace with stopjoint to check extension should be worn for some months. I believe that this principle is not generally understood, the joint being usually treated in extension. Mr. Martin [3] of Newcastle-on-Tyne was the first to emphasize the importance of this principle. I was associated with him for several months, and am indebted to him for this and many other practical points on knee injuries.

Reconstruction of the crucial ligaments, substitutions by silk ligaments, bands of fascia lata and tendons have been attempted by a few surgeons, but the results to be expected from such procedures are not yet definitely determined. Smith [5] reports some good results from the Hey Groves operation combined with repair of the internal lateral ligament.

Fracture of the tibial spine or its inner tubercle is produced in much the same way as rupture of the crucial ligaments. The internal lateral ligament also suffers. The treatment should be immobilization in 10 degrees of flexion, as more marked flexion during healing may result in extension being permanently limited

2. Morison, Rutherford: Injury to Semilunar Cartilages, Lancet **1**: 604, 1909.
3. Martin, A. M., and Walton, A. J.: Injuries of the Knee-Joint, Brit. M. J. **2**: 1070-1079, 1913.
4. Corner, E. M.: Surgery of the Knee-Joint, J. A. M. A. **63**: 1069 (Sept. 26) 1914.
5. Smith, S. A., in Jones: Orthopedic Surgery of Injuries **1**: 297-358, 1921.

by a bony block. If union fails to occur, it may be worth while to fix the bone in place by a bone peg, though Ryerson reports a failure from this operation.

Osgood-Schlatter disease, though necessarily occurring in youth, is occasionally seen in industrial work. If the tibial tubercle is separated and displaced upward, it should be promptly reduced and fixed in place by kangaroo sutures or a bone peg. If there is only a strain or partial separation of the epiphysis of the tubercle, a posterior gutter splint and adhesive strapping above the patella to keep the patellar ligament relaxed is simple and effective treatment.

Acute and recurrent dislocations of the patella seem well enough understood not to merit special mention here. The same may be said of fractures of the patella and rupture of the patellar ligament.

Fractures of the femur and tibia which extend into the knee joint frequently require open operation for reduction and maintenance of good apposition. But this should be resorted to only after a skilful attempt by gentle manipulation and splinting have failed to secure fairly accurate approximation. When reduction of fragments by conservative measures is not quite perfect, it may be very difficult to decide as to the wisdom of open operation. The trauma of the operation itself carries the risk of considerable disability, even though it may obtain perfect anatomic reduction of the fragments. Here, as in other fractures, the soft parts must be considered, and we must remember that good function is more important than a perfect reduction as shown in a roentgenogram. In case of open operation, it is hardly necessary now, I hope, to condemn the use of metal plates and other nonabsorbable materials. For the last ten years I have argued that Lane plates and Murphy nails were irrational methods of treating fractures, and that they are rarely necessary if one knows how to use kangaroo tendon, bone grafts and pegs, together with external appliances skilfully designed and applied. It is gratifying now to see this belief generally concurred in.

Open wounds into the joint cavity are a serious problem both as to life and to limb. To operate or not is often a most difficult question to decide. The excellent classification and recommendations of Gray [6] for war injuries of this joint are largely applicable here. When a septic joint results in spite of prompt and proper treatment, or otherwise, the Willems [7] method of free incisions, no drainage tubes and active movements seems to obtain the most thorough drainage and often gets surprisingly good functional results. This, however, requires courage and persistence on the part of both patient and attendants.

In the treatment of knee injuries through the convalescent stage, the most effective splints, properly timed and executed movements, massage, Bristow treatment of thigh muscles by graduated contractions to the faradic current, mobilization of stiff joints by special flexion and extension appliances, and the other physical means for obtaining the most rapid and complete restoration of function are the true test of the surgeon's skill and resourcefulness in these cases.

With the present workmen's compensation laws and the prevalent method of having this work done by contract surgeons and so-called insurance doctors, the ideal management of industrial injuries to bones and joints seems difficult of attainment. Evidently we must convince employers and insurance companies of the economic value to them of these modern orthopedic methods.

180 Eighth Avenue, North.

6. Gray, H. M. W.: Treatment of Gunshot Wounds of the Knee, Brit. M. J. **2**: 41, 1915.
7. Willems, C.: Treatment of Purulent Arthritis, Surg., Gynec. & Obst. **28**: 546 (June) 1919.

ABSTRACT OF DISCUSSION

DR. A. L. FISHER, San Francisco: Dr. Billington mentioned physiotherapy. As far as I know, the value of physiotherapy is practically nil. What is the action of electrical stimuli, light stimuli, etc.? I opened one joint that was subjected to diathermy treatment for a year. This was a villous synovitis. I made very careful sections, and as far as I could see there was no difference in that material from any other villous synovitis. I think that physiotherapy is in the same state that drug therapy was before the days of pharmacology—we are using it empirically and without foundation, and we all know what happened to drug therapy since the days of pharmacology.

DR. M. S. HENDERSON, Rochester, Minn.: We often speak of loose cartilages. As a matter of fact, a loose cartilage is very rare, and we should speak of it as a tear or fracture in the great majority of cases. Many patients are going about with some disability, not very severe, but they have a feeling of insecurity in the knee. In some cases we find that there is lack of full extension in the knee, although the patient claims that he can straighten the knee, but examination discloses that the knee slightly lacks full extension. Rutherford Morison has described a type of tear or fracture in the semilunar cartilage, which he speaks of as the bucket handle type of tear, and in my experience this is the most common lesion. Strange to say, occasionally there is no history of an accident or trauma of any kind. Some patients wake up in the morning with the knee locked. One point more that deserves attention is the fact that we have been overcautious in advising operations on the knee-joint, and many patients have been denied the benefits to which they are entitled. We have operated on more than 300 knee-joints for mechanical derangements, and have so far not had a single case of infection which involved the joint cavity. Our technic has been that which is accorded ordinarily, and would be demanded in any good operating room. We have had no special form of preparation. I think that the knee-joint is just as tolerant of infection as the abdomen.

DR. G. D. MARSHALL, Kokomo, Ind.: In reading roentgenograms of these disabilities of the knee, I think that the cloudiness of the prepatellar fat is often overlooked by the radiologist. Another thing is the protection of the soft tissues. There is no use in giving electric treatments, diathermy and physiotherapy if one lets the soft tissues become pinched the moment the patient starts to walk. The knee cage brace will permit him to walk. In many of these patients, when they go about limping, the soft tissues will be pinched. By the application of a knee cage brace, we protect the soft tissues from this repeated trauma. If this repeated trauma goes on, there will be the formation of new processes and a longer period of disability. There are many cases of arthritis in which, if we put on a knee cage brace, the patient will walk, and we cure the patient because he is using the knee all the time in the natural position. This is of particular value in industrial cases because the man will walk without any difficulty and, without this protection to the soft tissues, although we may treat the case for months, the first time he puts his leg in hyperextension he will get a traumatic synovitis.

DR. R. WALLACE BILLINGTON, Nashville, Tenn.: In answer to Dr. Fisher's question, I referred rather generally to physiotherapy. I myself use the simple forms of physiotherapy, of which movement, passive and active, is probably the chief and most valuable element; but this requires proper supervision. I do not believe in a lot of machinery and that sort of thing. I do not know just how much value there is to diathermy. I saw it used extensively in the departments with which I was connected during the war. Theoretically, it should have some value in aiding resolution, but I think we can get on without it very well. I think that exercise,

active and passive motion, is the biggest element in most cases. Massage helps to get rid of the edema and helps to restore the tissues to normal. Radiant heat and graduated contractions of the thigh muscles by the Bristow coil are also helpful at times in these knee cases.

THE ACUTE PAINFUL BACK AMONG INDUSTRIAL EMPLOYEES ALLEGING COMPENSABLE INJURY *

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The surgical consideration of alleged traumatic backache involves primarily a query as to whether a backache actually exists and secondarily an almost equally essential question as to the traumatic element in a lesion admitted to exist. The answer to both these questions remains a matter of diagnosis, an admittedly difficult problem when confronted, as we are, with a variety of etiologic factors covering a field which extends from congenital malformations to the chronic infections of old age.

MALINGERING

The investigations of recent years have made the answer to the first question far easier and have forced us to acknowledge the existence of pain and disability sometimes previously denied. Despite, however, the pleas for more careful examinations and for more hesitancy in denying the alleged existence of pain, the traumatic back still enjoys an unenviable notoriety as a sort of rock-bound refuge for malingerers, a reputation which we believe is unmerited. This presumption is not based on the absence of malingering among the subsequent cases, but rather on the retraction of such a diagnosis in four instances while following the patient through to complete recovery. There are excuses, however, for the suspicion with which backache is regarded, chief among which is the relatively large number of patients who allege injury as the specific cause of a nontraumatic disability. Careful consideration leads us to believe that these allegations are the genuinely conceived, but erroneous, premises of etiology which are characteristic of the lay mind regarding not only backache but a host of other human ills. For example, it is easy to trace the mental processes of a patient who, after a hard previous day's work, honestly concludes that the lumbago of today had its origin in the employment of yesterday. Such an individual is scarcely a malingerer, but rather the victim of a false conception, the more deep-rooted often because of tactless disputes at previous examinations.

A second, and more important, factor influencing our suspicions, and one which at first was thoroughly misunderstood, was the almost universal exaggeration of the subjective symptoms. Patients previously treated for painful injuries and known to have minimized the discomfort of them, commonly reported, making ridiculous claims relative to the disability arising from back lesions. Some little effort was made to explain these statements before the solution, which now seems self-evident, occurred. The employee, with an ugly and striking visible laceration, often submits silently to suture and insists on returning to work, a very natural bit of bravado and one that impresses his fellow workmen. On the contrary, the same person with a genuinely painful back appreciates the lack, this time, of evident injury. The foreman often views with suspicion his request for medical attention, consequently he presents himself for examination with the subconscious idea that the burden of proof is his and that he must impress the surgeon with his suffering or return to work and face a most embarrassing situation as regards his standing with his employer and fellow employees. This psychologic apprehension, if it be nothing more, immediately disappears on the assurance that a definite lesion is recognized and is appreciated by the examiner—the true malingerer is encouraged to enumerate still more weird disabilities. Before a diagnosis of malingering is made, two factors should be carefully discounted: the patient's very likely misconception of etiology and his not altogether groundless apprehension regarding the acumen of his surgeon.

FINDINGS

The following series of 156 cases is reported from the records of an industrial hospital devoted to the treatment of employees engaged in manual labor which offers unusual hazards for injuries to the back. The claimants were all adults, with ages ranging from 18 to 63, and, with three exceptions, men. A consecutive series was selected from those claimants whose complaint was a painful back and who alleged an injury as the specific cause. The original examinations were made, for the most part, within an hour of the accident; a few patients were not seen until the following day, and nine patients failed to report until after one week or more of incapacitation. In 92 per cent. the pain was complained of at a point below the level of the tenth dorsal vertebra, a finding which resolves us to a consideration almost entirely of the low back.

TABLE 1.—FINDINGS IN ONE HUNDRED AND FIFTY-SIX CASES OF PAINFUL BACK

Traumatic		Potential		Nontraumatic	
Strain	54	Postural strain	22	Infectious myositis	18
Sprain	11	Osseous abnormality	6	Infectious arthritis	8
Contusion	7	Coxa vara	1	Varicocele	7
Sacrolumbar	9			Lesions of urinary tract	4
Sacro-iliac	3			Osteomyelitis	1
Compression fracture	2			Dorsal Pott's disease	1
Spondylolisthesis	1			Carcinoma of liver	1
	87		29		40

The incidence in this region of certain frank traumatic lesions and certainly equally frank nontraumatic lesions was anticipated, but the attempt to classify sharply all the lesions encountered under these headings left a group that was definitely neither. More will be said about this group later; but for the present, it deserves consideration as a type offering inherent possibilities for disability, either with or without violence.

Those lesions classed as traumatic are essentially so; but the shadow of doubt cannot be denied as to whether or not an element of potential weakness does not often antedate the exciting violence in many of the strains, and also in sacro-iliac and sacrolumbar lesions. The nontraumatic lesions may be dismissed with a warning which their multiplicity well illustrates—the necessity for complete physical examinations. The patients were followed through to recovery, the diagnostic findings being those of the termination.

* Read before the Section on Orthopedic Surgery at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

POTENTIAL GROUP

The marked incidence of faulty posture among adult males has become somewhat a matter of common observation and has formed the basis for many assumptions which may logically be denied on evidence which proves that the majority of these static abnormalities are symptomless. Many are explainable on a hypothesis of poor nutrition during early life, plus sickness or overfatigue; but an analysis of any series of painful backs urges a consideration of the practically universal occurrence of some degree of bad body mechanics. The impression also forces itself on one that a considerable number may be found, roentgenographically, to reveal osseous and structural abnormalities responsible for faulty attitudes and even low back pain; the slender cylindric type of vertebral body, or the incidence of a sixth lumbar segment with a resultant lumbar lordosis and unstable hypermobility being a noteworthy example. Inequality in the length of the legs, unilateral sacralization of the fifth lumbar vertebra, impingement of a fishtail transverse process on the iliac crests, structural variations in the articular processes or occasionally the apposition of spinous process are not uncommon irregularities which seem to represent especial susceptibility to injury and are frequently mirrored in postural defects. The rigid and unyielding spine of quiescent chronic osteoarthritis is an additional structural type, delicately susceptible to slight trauma.

Considered on a basis of range of motion in the spine, these structural variations belong roughly to one of three types. These are in the order of their frequency: class in which there is hypermobility; another in which there is asymmetrical limitation of motion, and a third in which there is rigid immobility.

It must be admitted that some weakness exists in the foregoing assumption, for if correct in the assertion that structural abnormalities are commonly mirrored in postural defects, the image should, with reasonable certainty, indicate the underlying lesion. This we have not been able to demonstrate with a regularity which warrants diagnostic conclusions. We can and do recognize in the "lanky," hollow backed person something of his underlying osseous structure. The same is true of the stiff spine of the arthritic patient. Occasionally, the variation between the arcs of lateral bending in unilateral sacralization of the fifth lumbar segment will offer a suggestion of what the roentgen ray may reveal. The examination, however, so commonly follows the onset of the acute disability that the latter symptoms completely obliterate the previous picture.

A history of trauma is the rule with these patients, yet a sufficient number present themselves denying injury to force our acceptance of the possibility of disability not excited by violence. This uncertainty as to the true etiology offers the excuse for the term potential. That they are actually potential is still somewhat an open question;[1] but excellent affirmation often exists in the past occupational histories of these patients. The story commonly is one of frequent changes of employment in the effort to avoid heavy work. There is a process of self elimination which accounts for the rarity of "wandlike" spines among, for example, shovelmen and freight handlers. It is this autopremonition of impending disaster that best reveals the true inherent weakness and offers the strongest testimony in favor of the actual potential susceptibility of osseus abnormality to trauma. Solely on a basis of length of disability and a tendency to recurrence, this group has proved a sore trial. This condition could largely be avoided by the postural inspection of prospective employees. Once a reasonable assertion of trauma has been established, the claimant becomes compensable and generally remains so despite our best speculations as to whether he is essentially traumatic or structurally unfortunate.

TABLE 2.—ROUTINE OF EXAMINATION

	Onset	History	Posture at Examination	Muscle Spasm	Distribution	Painful Pressure Points	Referred Pain	Diagnostic Features
Traumatic strain	Within twelve hours	Recent change of occupation; continuous arduous work, or sudden unusual effort	Variable.....	Mild	Variable	Variable	None	Diffuse area of tenderness; pain on flexion of spine not markedly increased by extension against resistance
Postural strain	Slow	Never been able to stand heavy lifting; can endure walking better than constant standing	Leans against every available support with weight on one leg or sits in slumped manner	None	Bilateral	Over the iliolumbar ligaments	Occasionally, the posterior thigh muscles	Poor posture; iliolumbar ligaments tender; lack of muscle spasm and history of pain and fatigue after a day's labor
Sprain	Sudden	Severe effort or wrench, interrupted by a stabbing and disabling pain	Knees, hips and spine in slight flexion; back guarded with hands or hands on knees	Marked	Unilateral	Over the erector spinae at a well defined point	Radiating up and down erector spinae	Immediate disability; marked muscle spasm; painful limitation of spine flexion, aggravated by attempts at extension against resistance
Sacro-lumbar lesion (intrinsic)	Sudden	Severe twist of spine with the pelvis rigid; immediate disability	Spine held at a neutral point between flexion and extension, rotation toward affected side	Marked	Variable	Over the area of the articulation	Adductor thigh muscles, rarely below the knee	History, posture at examination, low back pain, pain in the thigh not extending below the knee; pain on rotation of spine on the pelvis
Sacro-iliac lesion	Sudden	Often premonitory backache; sudden "slip," occurring at a moment of slight effort	Affected thigh at midpoint between flexion and extension; sits on sound hip	Marked	Unilateral	Over the superior gluteal nerve	Marked along the course of the sciatic on the affected side	On the affected side, limitation of straight leg raising; pain elicited by abduction of hip with the thigh in 90 degrees flexion; occasional abolition of plantar and patellar reflexes
Infectious myositis	Generally on awakening	Recent focal infection or exposure	Guarded gait; sits on edge of chair, with weight equally on both hips	Marked	Bilateral	Wide area along the erector spinae	None	History, pain and spasm increased after resting; elevation of the temperature; severe pain on extension of the spine against resistance

DIAGNOSIS

Lack of space precludes the possibility of a discussion of differential diagnosis. The plan outlined in Table 2, however, has been of value in dispensary work.

1. Osgood, R. B.: Back Strain, an Accident or Disease? J. Industrial Hygiene 1:150 (July) 1919.

SACRO-ILIAC LESIONS

Previous writers [2] have called attention to the frequency with which pain low in the back has been attributed erroneously to sacro-iliac relaxation, an observation strikingly in accord with the present findings. Three cases only were encountered in this series, in which the patients exhibited an exaggerated lumbar lordosis, poor muscle tone and admitted premonitory low back pain over varying periods, factors offering a temptation to deny the lesions as essentially traumatic. All of them, however, alleged a specific trauma which in every instance was illuminating. Briefly, the first dated his incapacitation from a slip which occurred while alighting from a truck, the second while getting out of a bath tub and the third while leaning forward to pick up a light tool. It will be observed that the primary disability occurred at a moment of probable muscular relaxation or rather at a moment in which the surrounding musculature was not on guard against strain on the sacro-iliac articulations. This experience well bears out previous investigations in which the etiologic importance of the structure of the joint has been discussed. It likewise adds evidence to the importance of the muscular support, a fact further enhanced by a review of the histories of nearly 400 cases in which sacro-iliac subluxation had occurred only once synchronously under strain on the back of a person doing heavy lifting.

LUMBOSACRAL LESIONS

The region of the sacrolumbar articulation has acted as host to the referred pain from a complexity of lesions, many of which bear no anatomic connection to the joint proper and may be classed as extrinsic. In this group will appear most of the strains, both traumatic and postural; a few of the sprains, and a lesser number of the osseous abnormalities—entities whose only similarity is expressed in the location of the pain. The intrinsic possibilities are not less numerous; there have been observed spondylolisthesis, arthritis, fracture of the articular processes between the fifth lumbar vertebra and the sacrum, and strain or sprain of the intra-articular or the iliolumbar ligaments. These intrinsic lesions have been noted to exceed in incidence very markedly the affections of the sacro-iliac joints, a finding quite logically in accord with the existing anatomic possibilities in the two articulations.

In this series, restive torsion has played a rôle in the mechanics underlying sacrolumbar lesions which was quite distinguishable from the torsion plus partial muscular relaxation in the sacro-iliac cases. Commonly, the history was that of a severe twist on the semiflexed and lifting back, with the pelvis immobilized, as in leaning over a bench, and with the thighs pressed firmly against the edge to gain leverage. In such a position, should the load applied on the upper back through the arms and shoulders suddenly shift laterally, the fixed pelvis acts to prevent pivoting of the whole body. The patient must then choose a fall across the fulcrum represented by the table edge or receive the lateral twist on the lumbar spine, the weak point of which is the sacrolumbar articulation. If fortunate, the resultant lesion involves only extrinsic structures, but a not inconsiderable number of persons suffer sufficient mechanical insult to superimpose on an extrinsic lesion, actual disarrangement of the articulation proper, that is, the true sacrolumbar entity.

2. Lovett, R. W.: The Causes and Treatment of Chronic Backache, J. A. M. A. **62**: 1615 (May 23) 1914.

Despite the somewhat general acceptance of an increased lumbar curve as a symptom of sacrolumbar lesions, such has not been the rule among the intrinsic cases here observed. With the exception of spondylolisthesis in which the lordosis is structural, the remaining lesions have exhibited a marked muscle spasm. The spasm is seemingly an attempt to flatten the low back curve; relieve from strain the ilio-lumbar ligaments, and balance the spine on the sacrum at a neutral point.

CONCLUSIONS

Trauma is blameless as an etiologic factor in a large percentage of cases of alleged traumatic backs.

Malingering is of uncommon occurrence, but often is implied to the surgeon by the patient's false conceptions of etiology and an overanxiety to establish the recognition of a real disability.

Osseous abnormalities in the lower portion of the back furnish a potential group, especially susceptible to violence but capable of developing disability unexcited by trauma.

Sacro-iliac relaxations are of infrequent occurrence.

Sacrolumbar lesions are properly of two classes as regards the involvement of the articulation, extrinsic and intrinsic, the latter representing the grave traumatic lesions of most common occurrence.

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ABSTRACT OF DISCUSSION

Dr. J. Archer O'Reilly, St. Louis: The question of the back is very important, especially in relation to industrial accidents. The more one thinks one knows about the back, the less one knows, especially in studying roentgenograms. Such pictures of the back, especially of the normal spine, vary. Pictures taken of patients who had no backache showed a number of abnormalities that could be supposed to cause backache. I found, as Dr. Conn said, that there are various abnormalities of the fifth lumbar, seventh transverse process, etc., all of which are dependent factors in causing backache, and if trauma supervenes, these abnormalities will cause a serious backache. It has been believed that when backache has been caused by these abnormalities, the condition is very much more difficult to correct. These cases are much more difficult to cure than are the cases in which the back is more or less normal. I will not discuss the question of sacro-iliac strain. Whether the strain is in the sacro-iliac joint or not, the end-result is the same as far as the patient is concerned. For this reason backache in most industrial injuries is really an orthopedic condition. Many backaches are seen by men who are not orthopedists, and they sometimes think it is just a strain and does not amount to anything. The patient is told to rub with liniments, and he is allowed to go several months without treatment. They are orthopedic cases and should be seen by an orthopedist, and treatment should be begun immediately. A roentgenogram should be made in every case of injury to the back. A man who knows how to interpret a roentgenogram should see these patients and treat them from the beginning and not be expected to take charge of them several months after they have been injured. Some day we shall come to the point at which a great many of these men who are about to be employed in positions that require severe strains on the back or are likely to produce strain, such as mining, shall have a roentgen examination first so as to limit the possibility of a potentially weak back and to lessen the possibility of getting a man who will be injured easily and have to be paid a compensation.

Dr. Henry W. Frauenthal, New York: I appreciate the frequency of the percentage of sacro-iliac strains. In my own institution in more than 15,000 cases we had 471 cases of sacro-iliac strain. The patients were relieved by treatment.

A STUDY OF EXOPHTHALMIC GOITER AND THE INVOLUNTARY NERVOUS SYSTEM

IX. AN ESTIMATION OF THE PATHOGENESIS AND THE EVALUATION OF THERAPEUTIC PROCEDURES IN EXOPHTHALMIC GOITER *

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In 1835, Graves described a condition characterized by exophthalmos, goiter and tachycardia. To the classical triad of symptoms Charcot later added a fourth cardinal symptom, tremor. Further study of the syndrome indicated that all four symptoms did not necessarily occur in every patient, and that the only constant symptom was tachycardia. The variance in the clinical picture led to the introduction of such ill-defined terms as forme fruste, basedowoid, and larval hyperthyroidism. This classification, based on symptoms, was soon replaced by one based on disturbed function. Moebius recognized that many of the symptoms of the syndrome were the antithesis to those of myxedema, which had just been proved to be a thyroid deficiency disease. He therefore postulated that exophthalmic goiter was due to hyperthyroidism, the conception that prevails today.

Unfortunately, it is impossible to estimate accurately the output of the thyroid hormone, and the proponents of this theory have been compelled to resort to speculation and analogy to make their point. To prove that exophthalmic goiter is a hyperthyroidism, it is necessary to demonstrate an increased secretion in the gland itself or in the thyroid vessels. Tadpole tests ("Gudernatsch experiments") [1] fail to indicate any secretion in blood taken from the thyroid vein of patients with exophthalmic goiter, or from animals with hyperplastic glands. In one instance, electrical stimulation of the nerves of a normal gland produced sufficient hormone to hasten the tadpole metamorphosis, while similar stimulation of a hyperplastic gland failed. The potency of the thyroid hormone is proportional to its iodin content. In the hyperplastic gland of exophthalmic goiter there is a diminution of iodin.[2] There is no direct proof that an increased thyroid secretion is present in hyperplasia. What data are available indicate a decreased output and storage.

The inferences on which the theory of hypersecretion is based are:

1. Since the secreting surface of the hyperplastic gland is increased, it is postulated that the secretion also is increased. Against this inference, it may be urged that exophthalmic goiter may exist in the presence of a normal or colloid gland; that hyperplasia may coexist with thyroid deficiency (myxedema) in human beings and animals; hyperplasia may be present (endemic goiter) unassociated with symptoms of exophthalmic goiter. It is evident, therefore, that hyperplasia is compatible with normal or decreased function.

2. Many of the symptoms of myxedema and exophthalmic goiter are exact opposites, but many are possessed by the two in common (lymphocytosis, alimentary hyperglycemia, and hyperplasia of the thyroid gland); in fact, the two diseases may coexist.

3. The administration of thyroid gland may augment the symptoms of exophthalmic goiter or evoke some of them in normal individuals, but it has never been possible to produce artificially a typical clinical picture of exophthalmic goiter. The only constant symptoms that Carlson [3] was able to produce from feeding large quantities of thyroid extract to man and other vertebrates were loss of weight, gastro-enteritis and diarrhea. He never succeeded in constantly producing exophthalmos, tachycardia, goiter or nervousness. Other substances, notably cocain, epinephrin, ergotoxin and tyramin also augment or reproduce the symptoms even more accurately. Evidently, then, the effect of *feeding* thyroid is not necessarily a specific one.

Therefore, these inferential arguments, although superficially attractive, are not only not supported but are even opposed by scientific data. Accordingly, many exponents of the hyperthyroidism theory claim a disordered function, or dysthyroidism. Until there is proof that a qualitative alteration in secretion can occur, this speculation does not warrant discussion. That adenomas are not causative is evident from the fact that they may be present in cretinism (thyroid deficiency) and in endemic goiter (without general symptoms), and their avidity for iodin is less than in nontumor tissue of the same gland.

Definitions based on clinical descriptions and etiology are unsatisfactory.

We define exophthalmic goiter as (1) a clinical collection of sympathomimetic symptoms (tachycardia, tremor, exophthalmos, sweating, asthenia, polyrrhea [diarrhea], etc.), associated with (2) metabolic upset (elevated basal metabolism), and usually accompanied by (3) hyperplasia of the thyroid gland. No one of these three components is pathognomonic. Elevations of basal metabolism may occur in other conditions dissociated from goiter or alterations in the involuntary nervous system. Hyperplasia may also occur dissociated from alterations in the involuntary nervous system or elevation of the basal metabolism. Sympathomimetic manifestations may be present with or without hyperplasia of the thyroid gland and with a normal basal metabolism. It is to the last group of symptoms that we apply the term "autonomic imbalance." This syndrome differs from exophthalmic goiter only in that the basal metabolism remains normal. Patients with active exophthalmic goiter usually give a history of autonomic imbalance, and those with arrested exophthalmic goiter differ only in presenting a history of crisis. The transition from autonomic imbalance to exophthalmic goiter has occurred in a patient under our observation. This has led us to believe that disturbance of the involuntary nervous system plays an important rôle in the causation of exophthalmic goiter. The fact that stimulation of the involuntary nervous system by epinephrin produces an elevation of the basal metabolism and that this increase is independent of the thyroid gland suggested a more complete study of the involuntary nervous system, especially the thoracicolumbar division. Since it is admitted that epinephrin

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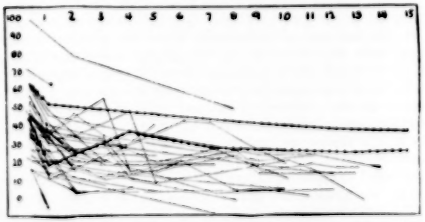
* Read before the Section on Practice of Medicine at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. Rogoff, J. M.: Aberration of Thyroid Secretion into Blood, J. Pharmacol. & Exper. Therap. **12**: 193 (Oct.) 1918.
2. Marine, David, and Williams, W. W.: The Relation of Iodin to the Structure of the Thyroid, Arch. Int. Med. **1**: 349 (May) 1908.
3. Carlson, A. J.: Experimental Hyperthyroidism in Mammals and Birds, Am. J. Physiol. **30**: 129, 1912.

acts only on the myoneural junctions of the thoracicolumbar division, the sensitiveness of these patients to the subcutaneous injection of epinephrin localizes the abnormality in the myoneural junctions.

As an index of the activity of this division, we used the vascular response to epinephrin of the pithed, decerebrate cat. We found that neither injection of thyroxin nor removal of the thyroid gland affected in any way the response of the thoracicolumbar division. Other workers using similar preparations and obtaining similar results ascribed the increased epinephrin response to the stimulation of the thyroid gland. This, we believe, is a misinterpretation, for we have shown that the increased response is due not to the thyroid but to a "sensitization" of the myoneural junctions of the thoracicolumbar division. Crile bases his explanation of exophthalmic goiter on the "sensitization" of the involuntary nervous system by iodin. We have satisfied ourselves that iodids have no such sensitizing power. We were able to exclude epinephrin, and showed that the other ductless glands play no evident rôle. We were therefore compelled to assume the position that in exophthalmic goiter we had evidences only of a disturbance of the involuntary nervous system and no clue as to the cause of this derangement. While the basal metabolism increase was most likely secondary to this upset, thyroid hyperplasia was difficult to explain. We are at present attempting to produce thyroid hyperplasia by creating autonomic imbalance. Whatever the mechanism, goiter is probably not responsible for the autonomic imbalance. For the present we regard the goiter as a purely secondary and symptomatic feature of exophthalmic goiter.

However interesting the study of the pathogenesis and definition of the disease, our main object in undertaking the pursuit was to outline a rational therapy for our patients. Since the time of Trousseau, remedies of all types and manner have been suggested, and at present these patients are reported "cured" by medical treatment, roentgen-ray treatment, mechanotherapy, organotherapy, spondylotherapy, and all manner of surgical procedures, from the injection of boiling water



Evaluation of therapeutic procedures in exophthalmic goiter: Upper dotted line, average of patients treated by roentgen ray (Means and Aub); lower dotted line, average of patients treated surgically (Means and Aub). Narrow lines are individual records of patients observed by authors. In these patients, no specific measures were instituted, and the course is "spontaneous." The elevation of the basal metabolism is used as the index in all.

to complete thyroidectomy. The reported success from so many diverse methods of treatment suggested that the disease might run a self-limited course toward arrest. In order to determine this point and to secure an index whereby therapeutic procedures might be gaged, we studied the spontaneous course in fifty patients. Our management consisted in placing the patients under conditions as ideal as possible in hospital wards. The basal metabolism was used to confirm the diagnosis and to estimate the progress of the disease.

During the year 1921, thirty-eight patients were observed and all are included in the accompanying chart, irrespective of the outcome. Two patients died, one (Patient 18) of an acute crisis of the disease and the other (Patient 14) of a terminal pneumonia and

COURSE OF THE BASAL METABOLISM IN INDIVIDUAL PATIENTS WITH EXOPHTHALMIC GOITER ("SPONTANEOUS" COURSE)

		Time in Months												
Patient	Admission	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. S. G.	48	38	48	36	..	..	..	..	..	22	..	25	..	..	17
2. R. B.	25	..	..	12	..	..	..	..	25	15	..	15	..	15	..
3. F. K.	55	42	36	..	40	10	..	..	..	..	22	17	..	0	..
4. M. N.	53	39	36	34	16	16	22	..	5	..	..	..	6	..	..
5. M. F.	54	46	46	56	16	..	..	..	29	16	..	20	18	18	..
6. S. J.	63	43	27	31	12	..	..	..	0	..	..	..	..	..	..
7. A. A.	37	..	..	..	..	..	..	..	..	..	..	..	14	..	..
8. F. B.	17	..	..	..	..	5	..	..	..	..	..	..	..	..	..
9. M. G.	64	47	..	..	..	..	..	..	..	25	..	25	..	..	..
10. F. C.	17	..	5	..	..	..	..	..	..	..	16	12	..	..	..
11. D. H.	58	42	29	35	..	21	..	..	28	..	..	12	..	..	..
12. M. R.	47	38	18	20	..	..	..	..	..	30	..	..	..	..	..
13. C. H.	35	12	..	..	..	..	..	..	44	43	27	21	..	..	..
14. S. M.	50	32	..	27	..	..	..	..	..	..	..	..	..	..	..
15. B. R.	48	..	20	..	15	..	..	..	..	..	..	6	..	..	..
16. H. H.	22	..	..	..	..	22	..	..	..	..	..	..	..	..	..
17. M. H.	40	14	..	..	..	..	..	..	7	..	..	..	..	..	..
18. I. K.	73	65	..	..	..	..	..	..	..	..	..	..	..	..	..
19. A. C.	39	27	..	..	31	..	..	..	..	..	..	..	..	..	..
20. S. G.	35	..	..	..	..	..	..	..	4	5	..	6	..	..	..
21. L. K.	36	25	4	..	7	..	..	..	..	..	..	..	..	..	..
22. H. H.	58	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23. R. A.	29	30	13	8	..	..	..	..	..	..	..	..	..	..	..
24. J. W.	36	15	18	..	..	10	..	..	..	..	..	..	..	..	..
25. L. R.	34	36	17	..	..	..	..	..	..	..	..	..	..	..	..
26. D. T.	24	19	..	..	..	..	..	..	..	..	..	..	..	..	..
27. G. S.	28	28	..	6	..	..	..	..	..	..	..	..	..	..	..
28. F. N.	40	33	36	..	..	..	..	..	..	..	..	..	..	..	..
29. R. F.	42	38	27	..	..	25	..	..	..	..	..	..	..	..	..
30. M. F.	48	35	26	..	..	..	..	..	..	..	..	..	..	..	..
31. D. F.	100	..	80	..	..	..	..	..	..	50	..	..	..	..	..
32. A. E.	50	..	..	..	35	..	..	..	..	..	..	..	..	..	..
33. M. D.	40	..	35	33	28	..	..	..	..	..	..	..	..	..	..
34. S. S.	64	50	..	22	..	42	..	..	..	..	..	..	..	..	..
35. W. W.	37	23	21	13	16	..	..	..	..	..	..	..	..	..	..
36. F. A.	46	38	25	22	..	..	..	..	..	..	..	..	..	..	..
37. E. B.	18	—5	..	..	..	..	..	..	..	..	..	..	..	..	..
38. S. G.	50	32	23	30	..	..	..	..	..	..	..	..	..	..	..

pericarditis following pyelitis. The data on two patients (7 and 22) are incomplete; but, since each is at work, the indications are that they have made at least a symptomatic recovery. The most striking thing noted in the other patients is the tendency of the basal metabolism to fall rather abruptly. The most marked decreases are seen in those patients who had the highest initial readings. In one patient (13) a recrudescence occurred in the seventh month; this was associated with pregnancy and pansinusitis. Patient 34 also had a recrudescence. It was impossible to secure her cooperation, and she is considered a failure.

We then attempted to compare the course followed by these patients with reported statistics. In spite of the fact that so many data on basal metabolism have been collected, it was found that but one report, that of Means and Aub,[4] contained comparable material.

The average curves of Means and Aub are for two groups of patients, the one treated by roentgen ray and the other by thyroidectomy. The first group had an initial basal metabolism averaging + 64, which fell to about + 38 at the end of fifteen months. The surgical group had a lower initial metabolism (about + 45). There was an immediate fall after operation to about + 20, and a secondary rise, reaching to + 38 in the fourth month—that is, to a little less than the original level. At the end of the fifteenth month the average was about + 27.

4. Means, J. H., and Aub, J. C.: Basal Metabolism in Exophthalmic Goiter, Arch. Int. Med. 24:645 (Dec.) 1919.

We have superimposed on these curves the course of the basal metabolism in each of the thirty-eight individuals listed in the chart. It will be seen that the average basal metabolism at onset in our patients was considerably lower than the average of Means and Aub's roentgen-ray patients, but about equal to the surgical group. Our patients showed a tendency to a decrease in the basal metabolism that was more marked than that in the groups studied by Means and Aub. This is particularly apparent in comparing our patients with the thyroidectomized group, for it will be seen that at onset approximately half of our patients had a basal metabolism above the average initial figure reported by Means and Aub. After the fourth month the basal metabolism of all but three of our patients was below the average figure for the thyroidectomized group at the end of fifteen months. Furthermore, on an average of four months after their admission to the hospital, these patients were restored to economic and social usefulness.

ABSTRACT OF DISCUSSION

DR. CHARLES F. HOOVER, Cleveland: Exophthalmic goiter has a long duration, and its course is characterized by frequent remission and exacerbation of symptoms. These characteristics of the natural history of the disease have been responsible for the introduction of a great variety of therapeutic measures. To estimate soundly the therapeutic value of any procedure in the treatment of such a disease requires very alert criticism. Hyperthyroidism is a word that has found acceptance in the minds of many medical men because it is the antithesis of hypothyroidism, which has been proved by clinical and experimental facts. This word hyperthyroidism carries with it the logical significance that has served practical purposes for many surgeons. Dr. Kessel indicated the great danger of accepting the meaning of a word without carefully weighing its significance. The acceptance of the word hyperthyroidism has smoothed the way for the indoctrination of ignorance on the subject. There is no doubt that many patients have endured partial removal of the thyroid gland, but a very small percentage of patients suffering from exophthalmic goiter succumb to it untreated by any other method than rest. The further one proceeds in the study of this mysterious syndrome, the more evident is it that the pathologic condition of the thyroid gland fails to reveal the source of the disease. To the uncritical and superficial mind, the disease appears simple and the pathogenesis seems easily revealed; but critical physicians have thus far found no solution of the problem. Dr. Kessel has added to the evidence that the known methods of studying the functions of the thyroid gland fail to yield any proof that exophthalmic goiter is due to hyperthyroidism.

DR. A. S. BLUMGARTEN, New York: There are two points which I wish to discuss: one is the relation between autonomic imbalance and hyperthyroidism, and the other is the differential diagnosis between hyperthyroidism and the clinical state of autonomic imbalance. Some years ago, Eppinger and Hess described certain constitutional states characterized by symptoms referable to the autonomic nervous system. They divided these states into vagotonia, showing evidence of disturbance in the function of the parasympathetic branches, and sympathicotonia, showing symptoms of disturbance in the sympathetic nervous system. Clinically, however, we very rarely see a state of pure vagotonia or pure sympathicotonia. It is much more common to observe a state of vagotonia and sympathicotonia together, or vagotonia changing into sympathicotonia, or vice versa. These conditions are characterized by marked variability. Patients may show symptoms of autonomic imbalance at one time and not at another. Furthermore, all sorts of combinations of symptoms occur which do not fit in with the definite states as described by Eppinger and Hess. The fact that symptoms of disturbed function of the autonomic system occur in hyperthyroidism and exophthalmic goiter indicates that there is apparently a relationship between these two conditions. Whether, however, the disturbance of the autonomic nervous system is the cause of hyperthyroidism or whether hyperthyroidism is the cause of the symptoms of autonomic imbalance is still a moot question. Dr. Kessel and his associates have attempted to solve this question. Their experimental work, however, consisted of the injection of various organic substances into animals under very artificial conditions. It seems to me, therefore, that their conclusions are more far-reaching than their negative findings suggest. All that one can say, from their experiments, is that the organic products as they can be obtained today have no effect on the autonomic nervous system under the artificial conditions in which the experiments were carried out. This, however, does not solve the clinical problem, which must still remain an open question. From the diagnostic standpoint, it is interesting to note that in large cities, such as New York, where conditions of autonomic imbalance are so frequent, the differential diagnosis between this state and hyperthyroidism is exceedingly difficult, even by a basal metabolic test, as it is very difficult to put such patients in a basal metabolic state with the the ordinary technic.

DR. H. T. HYMAN, New York: As one of Dr. Kessel's co-workers, I wish to respond to Dr. Blumgarten. The syndrome of autonomic imbalance was described on a clinical basis. The mechanism alone was made clear by the laboratory work. The use of drugs played a minor rôle in the experiments on the involuntary nervous system. Of far greater importance are the ablation experiments. The relation between autonomic imbalance and exophthalmic goiter seems to be as follows: There is present in the majority of patients with exophthalmic goiter a diathesis in the nature of an active autonomic imbalance; the transition from the diathesis, autonomic imbalance, to exophthalmic goiter, has occurred under my observation. When exophthalmic goiter is arrested, there is not a restitution to the normal but there is usually a resumption of the autonomic imbalance. In the literature on exophthalmic goiter, it is difficult to determine whether or not the persons reported really suffered from the disease. The utilization of the Goetsch test as a pathognomonic test leads to great error; according to tests on normal medical students and convalescent ward patients, a sensitiveness existed in about 30 per cent. The fact that sensitization may be produced weeks after complete thyroidectomy and that the injection of thyroxin, despite other reports, is without effect on the epinephrin response indicates that the sensitiveness is independent of the thyroid gland. To perform thyroidectomy on the basis of sensitiveness to epinephrin seems, therefore, without foundation. The second difficulty with the thyroid literature is the absence of reports as to end-results. Of the extensive writing on the subject of exophthalmic goiter, the splendid article by Means and Aub was the single report in which there could be no question as to the diagnosis and in which the end-results were accurately reported.

DR. J. C. AUB, Boston: I am very glad that Dr. Kessel has done this work. I wanted to do it, but did not feel justified in keeping patients in the hospital without any medical treatment. In an original paper I gave the results of rest for three or four weeks. In some cases there was a distinct improvement from rest, but in others, for whom rest did not seem to do much good, we started other procedures. In Dr. Kessel's series, rest was prolonged. Practically all of my patients had returned to their original occupations. They were not in bed, and certainly complete rest in bed would change the picture. The increased metabolism in exophthalmic goiter is most important. Most of the symptoms and signs which one sees can be explained by that increased metabolism; the nervousness, the sweating and the high pulse rate can be attributed to the effect of the active principle of the thyroid. The one sign that does not seem to be produced is exophthalmos. That is not seen in giving large doses of thyroid. That thyroid and epinephrin have different actions has been shown clearly.

Dr. Leo Kessel, New York: I am glad that Dr. Hoover used the term "lump in the neck" because the patients are embarrassed by its presence, and the significance of it should be explained to them. They should understand that "lump in the neck" is a secondary phenomenon. With reference to the autonomic imbalance and exophthalmic goiter, I realize that a clear-cut differentiation cannot be made; but none of the eighty-six patients with autonomic imbalance had an increased basal metabolism. In other words an elevation of the basal metabolism is the sharp line of demarcation between these two groups of patients. I consider these persons with exophthalmic goiter as having a decompensation, as it were, of their involuntary nervous system, so that the clinical differentiation between patients with autonomic imbalance and those with exophthalmic goiter is similar to the difference between the compensated and decompensated cardiac patient. These patients remain in the hospital for from six to ten weeks, and then they usually spend a month in the country. Following this period of rest, practically all of these patients return to their former occupations, working from eight to ten hours a day. Contrary to general belief, the pulse rate does not run hand in hand with the basal metabolism. I have had patients with an elevated metabolism of 60 per cent. who have a pulse rate of 80 or 90. I have seen the basal metabolism fall and remain at plus 10 or 20 when the pulse rate remained quite high. One occasionally sees persons who have a pronounced fall in basal metabolism until they have a normal metabolic rate, but the symptoms of the disease persist in a mild form.

THE EXAMINATION OF THE EYE BY DIRECT SUNLIGHT *

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It is a striking fact that the utilization of ordinary daylight in the lighting of the interior of buildings has been less developed than the arrangement and supply of artificial light. It is equally true that in the "darkroom" examination of the eye, direct sunlight has been very much neglected, while great ingenuity has been expended in producing and adapting to the purpose various forms of artificial light. Whether this is due to the existence of illuminating engineers and makers of apparatus chiefly interested in exploiting artificial light need not here be discussed, but we must recognize the fact.

Direct sunlight is not always available for the examination of the eye. But when available it possesses these advantages: It gives the standard illumination from which to judge or analyze colors; it gives light of maximum amount and intensity, easily reducible to any desired degree. But in order that it can be used, it must be turned in a convenient direction; and it must be rendered safe by shutting out any dangerous amount of heat and by avoidance of too great concentration of light on the retina. Its production costs nothing and its control need not be expensive. It has been used for some things many times, but its use is nowhere systematically described or adequately appreciated. So far as known, nothing on the subject has been published since my paper [1] calling attention to the value of direct sunlight in examining eyes with hazy media, and the way that such examination could be made safe by attention to the focusing, twenty-three years ago.

* Read before the Section on Ophthalmology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. Jackson, Edward: The Use of Direct Sunlight for Examining Eyes with Hazy Dioptric Media, Ophth. Rev. 18: 131, 1899.

GENERAL ARRANGEMENT AND CONTROL

In order to bring the sun's rays into the proper direction for such use, they must be reflected. This may be done by a heliostat that will keep them steadily directed on a certain point so long as the sun is shining on the instrument. This is desirable for laboratory work or certain lines of investigation. But for most ordinary clinical work, the only apparatus necessary is a simple inexpensive arrangement of a movable mirror, that will keep the rays turned on the opening by which light is admitted to the darkroom, during the period necessary for an ordinary examination, and, by readjustment, for any desired number of such periods.

At this opening, the light is modified to adapt it to the particular use to be made of it. It is admitted through a slit or small circular aperture for examination of the anterior segment of the eye by focal illumination, or microscopy of the living eye, or by a pin hole opening for skiascopy. It is received on a ground glass disk for ordinary ophthalmoscopy. The infra-red radiations are filtered out by alum solution, when the direct sunlight is to be used to penetrate hazy media; or a Vogt filter is interposed for ophthalmoscopy by red-free light; and such other modification is made of the incident pencil of rays as may be desired.

Within the darkroom, the apparatus and methods of using it are adapted to the special kind of examination to be made. The aperture itself is 50 mm. in diameter, and holds a ring that can be revolved in it, and which carries two clips, in which may be placed slits or circular apertures of various sizes, ground glass or glass to cut out undesirable radiations.

REFLECTION OF THE LIGHT

If the heliostat is employed, the only problems to be considered refer to the condensation or diffusion of the light. Reflection from a plane surface produces a certain diminution of the light dependent on the reflecting surface and the angle of incidence of the light. But this is not so great as seriously to lessen the enormous superiority of this source of illumination over others commonly employed.

With a simple mirror, not kept adjusted by a heliostat, the continual change in the direction of the incident rays from the sun makes an equal change in the direction of the reflected rays. This change of direction is 15 degrees per hour in the plane of the sun's path, or 1 degree in four minutes. This change of direction has two practical effects: (1) It causes the reflection to move off the aperture into the darkroom, so that direct sunlight no longer enters through this aperture. This affects all kinds of examinations made with it (Fig. 1). (2) It changes the direction and, therefore, the position of rays admitted through the aperture within the darkroom, so that the change must be compensated by some optical adjustment, or the eye under examination moved as the light passes off it. These two effects and the problems they raise are to be considered separately.

1. With a plane mirror, the movement of the area of reflected light across the aperture depends on the width of the mirror and its distance from the aperture. Disregarding the width of the aperture, as we may for a pin hole opening, or a narrow slit running in a plane perpendicular to that of the movement, and other details unimportant in this connection, the distance of the mirror is to the width of the mirror as 1 is to the tangent of the angular change required to carry the

area of light entirely across the given point. Thus, at 1 meter, a mirror 20 cm. across would subtend the angle of 11 degrees, requiring 11 degrees change in the direction of the sun or forty-five minutes of time to cause the light to move off the aperture.

2. With the convex or concave mirror, a new factor is introduced, the focal distance of the mirror, which directly modifies the time required for the reflected light area to pass off the aperture. Without serious error for this purpose, we may disregard the width of the sun's disk and think of it as a point of light. The mirror forms at its principal focus an image of the sun,

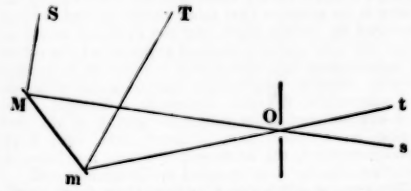

Fig. 1.—Effect of movement of sun on light reflected on the opening. With the sun in the direction S, the ray reflected by the mirror at M will enter the opening O, going toward s. When the rays come from T, the one reflected from m enters at O and goes toward t.

and it is the slight change in the position of this image that we have to think of in comparison with the width of the mirror, as determining the length of time the aperture will continue to be illuminated. Or, to put it in a different way, the angle subtended by the light area will be equal to the angle subtended by the mirror at this principal focus. Suppose the mirror 10 cm. in diameter has a focus at 50 cm. from the mirror. It would subtend an angle of about 11 degrees, requiring more than forty-five minutes for the reflected light area to move across the aperture. The same reasoning applies to the reflection by a convex mirror, except that the focus in this case is a virtual focus behind the mirror instead of a real focus in front of it.

Reflection of the light from a concave or convex mirror will prove satisfactory for general ophthalmoscopy, or rough illumination of the anterior segment. But it is not satisfactory for microscopy of the living eye, or for skiascopy, because of the astigmatism of the reflected pencil from a spherical surface placed obliquely. For the latter purposes, the light should be reflected from a plane mirror, and concentrated or diffused by a convex lens placed perpendicular to the path of the reflected rays (Fig. 2).

The change of direction of the reflected sun's rays in the darkroom is of no importance except where they are to fall directly on the eye, as for microscopic examination of the cornea and iris. For most clinical purposes, the position of the illuminated area may be controlled, as in ordinary focal illumination, by interposing a convex lens and moving it so as to concentrate the light where it is wanted; the prismatic action of a certain part of the lens being sufficient to focus the light where it is wanted, until any ordinary examination will be completed.

But for microscopy of the living eye, the aberration of peripheral portions of the condensing lens interferes too much with the accurate focusing of the illuminated aperture on or near the tissues to be examined. For greatest accuracy of illumination, the light may be carefully focused on the part to be examined, and the eye slowly moved with the head rest and microscope, so as to keep the part under inspection continuously in the light.

The amount of movement that is required to keep the area of light on the patient's eye is proportioned to its distance from the aperture that admits the light into the darkroom. At 25 cm., the movement, with the light reflected from a plane mirror (the maximum in practice), is only 1 mm. per minute, a rate that permits careful serial examination of the different layers of tissue, without movement, but allows continued examination of a single plane of tissue by a corresponding slight movement of the microscope and the patient's head.

FOCAL ILLUMINATION AND MICROSCOPY OF THE LIVING EYE

For this examination, the patient is seated in the darkroom, with the eye to be examined on the side toward the aperture through which the light is admitted. For use of the simple loupe, Coddington lens, ordinary binocular magnifier, or the binocular microscope attached to a headband, the patient's head is steadied in the proper position by the surgeon's hand, which also keeps the lids retracted, so that the lashes will not interfere with the lateral illumination; and by slightly drawing the patient's head forward or pushing it back, the structures under inspection are brought or kept in the illumination desired.

It should be borne in mind that the recent enormous advances in microscopy of the living eye have been made not by any important change in the microscope used, but by improvement of the illumination. Direct sunlight is capable of giving the most intense and definite illumination, and by it the value of the commonly employed methods of magnifying the eye can be greatly increased, revealing appearances that were quite unknown until Gullstrand applied the slit lamp to studies of this kind.

When the larger fixed form of binocular microscope is used, the Czapski instrument, a fixed head rest is

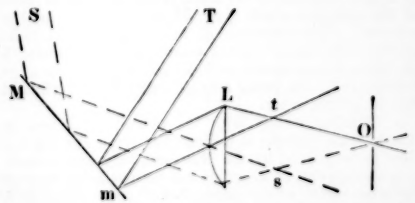

Fig. 2.—The convex lens L has been interposed between the mirror Mm and the opening at O. The angle tOs subtended at O by the lens L is the measure of movement of the sun before the light passes off the opening.

essential. This may be a simple window chin rest, with a metal band crossing above, against which the patient's head is firmly pressed. This is rigidly fixed to the table on which the microscope is placed, the whole moving together on large casters. With the head thus placed, the whole is adjusted, so that the light falls on the patient's eye. The patient's height must be adjusted by an adjustable seat, and the height of the eye in the head rest may be controlled by a pad or towel folded and placed under the chin, or an adjustable chin rest may be added.

If the mirror that reflects light into the darkroom is supported so that it can be raised or lowered a little, such adjustment, causing the pencil of rays to pass a little obliquely upward or downward, will bring the light to the desired height for any eye, without any adjustment of the chin rest. With the pencil of rays passing somewhat upward, the temporal part of the lashes interferes less than if the light comes exactly level. For some examinations, the patient's head and the microscope should be turned so that the light comes more from in front; and in other cases the lid should be drawn up by the finger of an assistant, so as to raise the lashes.

OPHTHALMOSCOPY

This includes three procedures: (1) ordinary ophthalmoscopy for examination of the fundus through clear media; (2) ophthalmoscopy by modified light, as red-free light; (3) ophthalmoscopy by direct sunlight, to reveal deeper structures through hazy media.

1. If the direct rays of the sun are reflected on a ground glass disk placed in the aperture, there results a rather brilliant perfectly uniform source of light that may be used just as the lamp or gas flame, or the incandescent mantle, or a white opaque glass, incandescent electric lamp. Seen by this light, the normal fundus appears less red than by the various flames, or the white glass incandescent lamp; but not so pale as when seen by diffuse daylight from the blue sky or gray clouds, or by light from some of the incandescent gas mantles. This illumination by direct sunlight, on standard white ground glass, should furnish a permanent light standard, with which other forms of illumination may be compared at different times and in different parts of the world, being in the long run less variable than any artificial source of light.

2. To secure the red-free light of Vogt, a filter, such as he has used, is placed before the aperture. A slit and prism, so placed with sufficient intensification of the light by a condensing lens, will render available ophthalmoscopy with any of the colors of the spectrum. The Vogt filter consists of two parts: First, a solution of copper sulphate 30 per cent., placed in a cell in front of the aperture which gives 25 mm. thickness of the solution. This excludes all infra-red and red radiations. The second part is a solution of erioviridin, 1 per cent., 3 mm., which excludes the orange and orange yellow rays. The latter may be replaced by a celluloid film of proper color.

3. Ophthalmoscopy with the unmodified direct or concentrated sunlight is useful when the media are too hazy to be pierced by the illuminants commonly used. It is strange that no attention has been called to it since the presentation of my paper, before mentioned. It is subject to certain possible dangers that must be borne in mind, but are readily guarded against. The undue concentration of infra-red (heat) radiation would be harmful, and the undue concentration of light might be a source of danger to the eye, if the light were kept too long focused on the retina. The danger of heat concentration is readily avoided by placing before the aperture a filter of 6 per cent. watery solution of alum.

It is to be remembered, however, that in the solar spectrum, the heat radiations reach their maximum near the red end of the light spectrum, then decline rapidly in the red and more slowly toward the ultraviolet. A filter containing copper sulphate stops most of the heat found in association with light. But it is not suitable for this particular purpose, because the red light, cut out by such a filter, is the light that penetrates best through hazy media.

However, the alum solution stops so much of the heat that any danger from that source is removed. Indeed, my work with concentrated sunlight, to see through hazy media, has been done almost entirely without any heat filter whatever, care being taken not to concentrate the rays too strongly or to subject any one part of the tissue to the influence too long at a time. This care should be exercised in any case, to avoid possible danger from intense light.

The danger from too intense light seems to be avoided entirely by not concentrating it on the retina. There is no evidence that other tissues of the eye are damaged by intense light, and the evidence seems to show that only rather prolonged exposure of the retina to concentrated light, accurately focused on it, is dangerous. Kostich[2] reports the case of a girl with one eye emmetropic, the other hyperopic, 2 diopters. The first eye suffered from prolonged gazing at the sun during an eclipse. But, although both eyes were equally exposed, the ametropic eye was not injured. He cites a similar case reported by Tschémolossoff.

The eyes on which direct sunlight is used for examination are safe from this form of injury, because they are usually blind to start with, and because of the haziness of the media, on account of which the reflected sunlight is used, and which causes enough diffusion of light to prevent retinal lesions. But all possibility of damage of this kind in any eye may be removed by focusing the light in the media some distance in front of the retina, or in the air in front of the eye. The concave mirror used by the indirect method, or held a few inches away from the eye is quite safe.

As to any danger from the concentration of ultraviolet radiations on the eye, ordinary optical glass is so opaque to these that they are greatly reduced by the glass of the mirror, and the condensing lens and the glass of the heat filter; and the anterior media are so opaque to ultraviolet radiations that no harmful amount could reach the back of the eye in the comparatively short time it is under examination. The only chance of harm from this source would be in the concentration of ultraviolet light on the cornea or crystalline lens. This danger would be greater with lateral focal illumination of the eye by direct sunlight than with ophthalmoscopy. But no unpleasant or harmful effects that could be ascribed to it have been noticed during such examinations.

SKIASCOPY

At the point of reversal for the shadow test, the retina appears so magnified that the image of a single point occupies the whole of the pupil; and it is a point of the retina that is illuminated mainly or wholly from the sight hole of the skiascopic mirror. At, or near, the point of reversal, the area of light in the pupil depends chiefly on the light reflected from the sight hole. No such light is reflected if the sight hole is cut through the glass, and there is only the reflection from the unsilvered surface, when the silvering is removed to make the sight hole, and the glass left.

The sources of light heretofore used for skiascopy are not reflected from unsilvered glass, in sufficient quantity to serve in making practical the test. But direct sunlight gives a reflection from the uncoated

2. Kostich, D.: Ocular Troubles Following Direct Observation of a Solar Eclipse, Precession Volume of An International Congress of Ophthalmology in Washington, 1922.

glass surface bright enough for all practical purposes, one quite superior to the reflection of artificial lights from a silvered surface, and this reflection can be obtained from every part of the sight hole. Any piece of flat glass, such as a microscope slide or a weak lens, can be successfully used for the test. The plane glass acts like a plane mirror, a surface concave toward the source of light as a concave mirror, or convex toward the light as a convex mirror.

A difficulty arises from the fact that each surface of the glass gives its own reflection; and, except for light falling perpendicularly on both surfaces, these

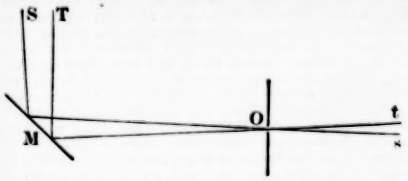

Fig. 3.—Direct sunlight admitted through pin hole aperture. Rays on margin of the sun, S, and from the other, T, are reflected by the mirror, M, into the opening O, where they cross. The angle, tOs, is equal to that subtended by the sun's disk, 32', here exaggerated.

two reflections do not coincide. The doubling of the reflection, even when slight, makes skiascopy more puzzling and difficult. The undesired reflection may be avoided in various ways.

If one surface is plane, the other may be made convex or concave so that the diffusion of the light it reflects will make it so feeble that it will not be noticeable, and will cause no confusion with the reflection from the plane surface. Or one surface may be plane or curved just enough to give the desired reflection of a concave mirror, and the other more strongly curved so as to give a feeble reflection that will not be noticed. However, the curves needed to diffuse one reflection and make it invisible cause a lens action, when looked through at the sight hole, that is generally undesirable.

To avoid the undesired reflection, without the undesirable lens action, the *prism mirror* has been adopted. The two surfaces of the glass make an angle with each other; an angle of 1 degree is best, so as to throw their reflections in different directions. It is then easy to throw one on the eye, while the other is thrown elsewhere and causes no interference with the one in use. The inclination of the surfaces and the distance of the mirror from the patient can be so adjusted that one area of light will fall on one eye, and the other area on the other; and the movement of light and shadow in both pupils will be visible for comparison at the same time, under exactly similar conditions.

The mirror may be made with one surface plane and the other concave toward the source of light. A 1.00 diopter planoconvex lens, silvered on the curved side, gives a concave mirror with a focal distance of about one sixth of a meter, which can be used as a concave mirror for skiascopy by ordinary light. The plane side, unsilvered, is available for skiascopy by direct sunlight. Such a mirror should have a sight hole 4 mm. in diameter which will give at 1 meter a space 20 mm. in diameter with no reflection from the silvered surface. This central area of feeble illumination is to be thrown on the patient's eye when direct sunlight is used, and the other eye screened by an opaque disk before it in the trial frame, to shut out the brighter reflection from the silvered part of the mirror.

In using the "prism mirror," it is not necessary to screen the eye which is not under observation, because the bright reflex from the silvered plane surface is thrown only in a single direction, and can be on the brow, where it is a help in judging the position of the feebler reflection that is used. The reflection from a concave silvered surface forms a large circle of light, any part of which is unpleasant to the eye on which it falls, and which can be avoided only by screening the other eye or by introducing a very strong prism effect.

For the use of direct sunlight for skiascopy, a pin hole disk is placed in the aperture to the darkroom. An opening 1 mm. in diameter admits ample sunlight for the test, and affords an extremely delicate and accurate objective test for astigmatism. Indeed, the reflection of such light from the plane mirror is stronger than is necessary, and may be diminished with benefit.

The direct light from the sun, admitted to the darkroom through a pin hole, is all that is necessary. But the pencil thus obtained is so narrow that a slight movement of the examiner's head and mirror carries the region of the sight hole entirely out of it. This may be understood from Figure 3. The sun's disk as seen from the earth subtends an angle of a little less than 32 minutes. This will be the angle of the pencil entering the darkroom. Such a pencil is only 9 mm. in diameter, 1 meter away from the sight hole, and would have to travel four or five times as far before being wide enough for easy use.

But by placing a convex lens in front of the aperture into the darkroom, as shown in Figure 4, the angle of the pencil of rays in the darkroom can be enlarged to any desired extent. It then becomes the angle subtended at the aperture by the part of the lens through which rays are thrown on the sight hole. Thus, if a 2 diopter convex lens is placed with its focus near enough to the sight hole to throw light on the aperture from a circle 20 mm. in diameter, the pencil of rays in

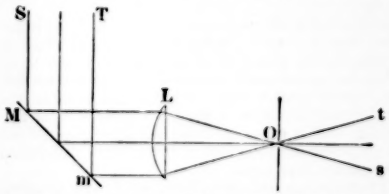

Fig. 4.—A convex lens, L, placed between the mirror, Mm, and the aperture O. The angle, tOs of the pencil in the darkroom will equal the angle subtended by the part of the lens from which rays enter O, even when the rays were originally parallel.

the darkroom would have a diameter of 20 mm. at half a meter from the aperture, or 40 mm. at 1 meter from the point at which the light entered. The diffusion of light produced by such an arrangement with a 2 or 3 diopter lens still leaves the light intense enough for the test.

TRANSILLUMINATION AND PHOTOGRAPHY

The use of direct sunlight for transillumination of the eye, or of the adjoining sinuses, is perfectly practicable, and it offers the advantages of a very powerful means of illumination. But to bring the direction of the light sufficiently under control, and to furnish it of

proper intensity in the desired direction, requires more elaborate and costly apparatus, that has not been worked out to a practical basis and is rather apart from the purpose of the present communication, which is to call attention to the value of sunlight in ordinary clinical examinations, and some of the more simple and generally applicable methods of using it.

The same is true with regard to the application of direct sunlight to photography of the living fundus of the eye. But in this direction, the substitution of sunlight for the sources of light hitherto employed would be quite simple, and would lessen rather than increase the expense.

COMMENT

In working with such a light, one can get the best results only by keeping his own eyes in good condition, by avoiding the dazzling afterimages that follow looking directly at a brilliantly illuminated point. This is especially true with regard to the brilliant image of the sun formed near the aperture to the darkroom, in adjusting it to give the desired illumination. This caution is needed also with regard to brilliant artificial light.

In general, the closer study of methods of lighting will greatly improve our methods of examination of the eye, and we have in direct sunlight the agent with which the general principles of illumination can best be studied. The opening into the darkroom, and the mirror to reflect the light on the opening are the simple means by which such studies are made possible to anyone who has some acquaintance with optics.

It is true that sunlight is not obtainable everywhere and always; but that is also true of every agent or piece of apparatus used in scientific experiment. There are many places in which it is as much to be relied on for certain hours each day as the usual sources of artificial light. In a town in Colorado, a hotel keeper advertised free board to all his guests every day that the sun did not shine; and it was several years before there was a day on which he could be called on to give it.

To determine the presence or absence of an intraocular tumor would justify leaving one's office to examine the eye where direct sunlight was available, or having the patient come repeatedly to use a favorable hour. Such patients have been watched months and years, or until the onset of glaucoma symptoms for this purpose; and in many cases the point could be settled by a single examination with direct sunlight that would penetrate the hazy media.

As to skiascopy, the use of direct sunlight is rendered practical and convenient by the prism mirror, which reflects the light into the eye from the direction of the very center of the observer's pupil, and thus removes those difficulties of the sight hole that have long been recognized as limiting the delicacy and accuracy of the shadow test. It is possible that a source of artificial light may be found brilliant enough to be used in the same way with the prism mirror. The gain by such a modification of the method is great enough to justify its universal adoption.

The possibilities that direct sunlight affords for laboratory investigations have not been touched on. The value of results to be attained through relatively simple and inexpensive methods for its clinical use fully justifies this calling of attention to it.

Majestic Building.

ABSTRACT OF DISCUSSION

DR. MARCUS FEINGOLD, New Orleans: The essential condition a light source must possess to be serviceable for our purposes is that of high intensity, and it must be as uniform as possible. In this direction the labors of Gullstrand with the Nernst slit lamp, the nitro slit lamp, and the Pointolite lamp, are extremely instructive. Dr. Jackson's suggestions as to the use of sunlight for this purpose present the problem in the most elementary form, for there is no stronger source of illumination, and none more uniform, than sunlight. Sunlight for ophthalmoscopy has been tried in a limited degree only, partly because most investigators were still under the influence of the old dictum that details in the fundus could best be seen with weaker illumination. Under certain conditions weaker light will bring out details that may be overshadowed, so to say, or extinguished by the greater light. But strong light has the undoubted advantage that it can give all the results claimed for it, and that slight modifications, such as screens and filters of the simplest nature, will convert it into a light having in addition all the advantages of a feeble illuminant. On a few favorable occasions I have used sunlight for fundus examination. One cannot help being impressed by the greater satisfaction experienced during the examination of the fundus with the newer light sources, the Gullstrand apparatus, the Azo projection lamp, and undoubtedly one would experience even greater joy seeing the fundus under direct sunlight. Vogt has shown that colored, and especially red free light, will help detect details that are otherwise almost invisible. But this method has the great disadvantage that the light intensity is tremendously reduced by the filter and that this defect must be counterbalanced by a stronger original light source. Only the electric arc can give real satisfaction for this and, of course, also direct sunlight. On the other hand, the greater resolving power of strong light will make details visible that otherwise would escape observation. Details in the cornea, aqueous, iris, lens, vitreous, become visible with the daylight globe, Azo globe, Gullstrand lamp, slit lamps and most probably, though I lack personal experience, with the Pointolite lamp, and undoubtedly also with daylight. Things never dreamed of become visible. Sunlight has its limitations over which we have no control, but that should be no reason why we should not use it whenever we can.

DR. GEORGE F. KEIPER, Lafayette, Ind.: During my student days we used to examine fundi and the throat a great deal with direct sunlight, especially the larynx, and the picture is quite different from that obtained by artificial illumination, and very beautiful. But the trouble in our location is that direct sunlight is such a variable quantity. We have many cloudy days. Besides, the atmosphere is smoky. A practical point in the use of the red free filter of Vogt is that some of the glass filters on the market are not red free. Some of the solutions are not red free. A simple method of determining this point is to test the filter with the ordinary pocket spectroscope, which really ought to be a part of our armentarium, especially in making tests for color vision or its absence. By holding the filter in front of the spectroscope in full daylight the red end of the spectrum ought to be eliminated if the filter is correctly made.

DR. WILLIAM C. FINNOFF, Denver: I have examined the anterior segment of the eye with sunlight under Dr. Jackson's direction, and found the illumination as satisfactory as with the slit lamp. For the use of the corneal microscope we certainly have a satisfactory source of illumination in sunlight. The picture we obtain with the red free filter is very striking and the fundus is well illuminated. It is a revelation to use the Jackson mirror with the prism in the shadow test. The band of light and the movement of the shadow are brought out very strikingly.

DR. EDWARD JACKSON, Denver: The possibility of getting direct sunlight under control is easy, and if the dark room is situated where sunlight can be reflected through some window during office hours, it is possible to see a great deal with ordinary focal illumination that we have not been able to see with former sources of light. We cannot control sun-

light, however. Some days it will not be there; but there are many things possible with it that make it worth while to have the patient come again and again, especially in cases of suspected tumor of the fundus. It certainly does penetrate through a hazy lens far better than artificial light. It is absolutely safe. I have been making use of it for twenty years and most of my work has been done without any attempt to filter out the heat rays, and by avoiding long exposure I have not had the slightest trouble. An alum filter will render the light just as safe as regards heat as any artificial source of light.

ACHYLIA GASTRICA *

JOSEPH SAILER, M.D.
PHILADELPHIA

Achylia gastrica was first described by Fenwick [1] in 1877. He then reported four cases that were undoubtedly progressive pernicious anemia characterized by a yellow discoloration of the skin, the absence of free hydrochloric acid in the gastric contents, the probable absence of ferments in the gastric contents as indicated by the undigested condition of the food, and a rapidly progressive and fatal course. He called these cases atrophy of the gastric mucous membrane. Quincke, Jaworski [2] and others studied the condition at the same time. The literature is considerable; but, on the whole, it cannot be said that achylia gastrica has excited any great degree of attention on the part of the medical profession. This has been largely due to the fact that it is often merely a complication of certain other conditions, such as carcinoma, progressive pernicious anemia and amyloid disease, and that very often it may exist without attracting the attention of the patient or, if its existence does cause symptoms, the patient nevertheless may be well nourished and in no particular danger from the defect in the gastric secretion.

Probably the best definition is that it is a persistent failure of free hydrochloric acid in the gastric contents and the absence of gastric ferments. If we accept Fenwick's original statement that the total acidity should not exceed 4 or 5, this would exclude nearly all of the cases, because there are few that will not, at times, show a total acidity in excess of this amount.

On the other hand, there are frequently cases in which the total acidity is comparatively high and yet free hydrochloric acid and the ferments are absent. It seems to me that this is a matter of comparatively little importance.

I have endeavored to determine the hydrochloric acid deficit and to draw some conclusion from it regarding the nature or degree of the case, but I have been unable to do so. When there is any considerable deficit, however, the ferments are invariably absent, so that it is qualitatively of some value, apparently, in making the diagnosis.

In 1888 and later in 1892, Einhorn [3] called attention to a very important clinical distinction between those forms of achylia gastrica which are associated with some other condition and those in which apparently the defect in the gastric secretion is the principal lesion. He noted particularly that in many of these cases the patients manifested symptoms associated with a condition known at that time as neurasthenia. This appears to have been recognized as a correct observation, but to my mind the attention that it deserves has not been accorded to it. It was about this time that some American physicians, Henry, Kitticott, Osler and Stockton, emphasized the association of achylia gastrica with anemia.

I have recently gone over some of my more typical cases of achylia. The results are summarized in the accompanying tabulation.

They indicate that achylia gastrica is more common in women than in men, almost two to one; that it is much more common between the ages of 30 and 60 years than at either of the extremes, and that during the thirty years of middle life, it is about equally common in all the decades; that in about half the cases the nutrition is from fair to very good and in about half it is from poor to very poor. Contrary to my belief when I started the investigation, constipation is twice as common as diarrhea, and in about one third of the patients the bowels are normal. In 18 per cent., the tongue can be described as abnormal. These abnormalities consist of either persistent soreness or a sour or bitter taste, and a red or glossy appearance of the tongue. In 60 per cent., the tongue appears to be normal.

FINDINGS IN TYPICAL CASES OF ACHYLIA

	Male	Female	Total
Patients	21	37	58
Age:			
From 20 to 30	4	2	6
From 30 to 40	5	10	15
From 40 to 50	5	8	13
From 50 to 60	4	12	16
From 60 to 70	4	3	7
Duodenal contents:			
Trypsin and amylopsin	..	..	4
Nutrition:			
Very good	5	6	11
Good	..	3	3
Fair	4	4	8
Poor	4	12	16
Very poor	2	11	13
Bowels:			
Constipation	..	..	31
Diarrhea	..	..	12
Normal	..	..	14
Tongue:			
Normal	..	..	29
Sore	..	..	4
Pale	..	..	13
Red	..	..	3
Glossy	..	..	2
Gallbladder:			
Normal	..	..	43
Infected (?)	..	..	8
Infected (certain)	..	..	3
Jaundice	..	..	1
Mental:			
Anxiety	..	..	12
Depressed	..	..	8
Vasomotor	..	..	1
Normal	..	..	34
Pulse:			
From 60 to 70	..	..	10
From 70 to 80	..	..	20
From 80 to 90	..	..	11
From 90 to 100	..	..	8
100 plus	..	..	3

Stress has been laid on the relation of gallbladder disease to achylia gastrica. In three, or 6 per cent., of the cases, operation either had been performed before I saw the patient or was performed afterward and gallstones were found. In eight, or 16 per cent., of the cases, there was an examination of the duodenal contents that indicated the presence of some pathologic condition in the gallbladder, and one patient reported having had jaundice. This is rather a larger proportion of gallbladder cases than would ordinarily be found.

* Read before the Section on Gastro-Enterology and Proctology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. Fenwick, Samuel: Lancet 2:1 (July 7) 1877.
2. Jaworski, W.: München. med. Wchnschr., 1887, pp. 117, 634.
3. Einhorn, M.: M. Rec., June 11, 1892.

I noted particularly in all these cases the mental condition. All together, fifty-five cases were studied from this standpoint, and twelve had a typical anxiety neurosis, if I may be permitted to use this term. Eight suffered from more or less profound depression that sometimes interfered with their work. One complained of various vasomotor disturbances, which were not associated with the climacterium or sexual involution. In thirty-four, no definite mental disturbance could be observed.

The pulse rate yielded nothing of significance. There was a slight tendency to tachycardia, and twenty-two had a pulse that was persistently over 80; but in only three of these was it over 100.

For various reasons, complete examinations of the duodenal contents were not made as frequently as I desired. In only four cases were careful and repeated examinations of the duodenal contents for the pancreatic ferments made, and in all of these only trypsin and amylopsin were tested. Schoppe [4] remarks that the findings are monotonous. They all show that the pancreas is functioning actively. It would seem as if this must be the case, because it is hardly conceivable that a person with combined achylia gastrica and pancreatica would survive. I am not aware that any such case has been recorded, but I have not by any means exhausted the literature. It is idle to speculate as to the way in which this occurs. It would seem as if the nervous supply to the gastric glands should be stimulated as is the nervous supply to the pancreas, but this is evidently not the case. We must also assume that the substance that excites the secretion of the pancreas is very different from that which excites the secretion of the glands of the stomach.

There is also adequate proof in this finding that the gastric secretion is one of the dispensable functions of the body, for many of our patients not only are well nourished, but may improve nutrition without the return of the gastric secretion.

Achylia gastrica is probably in large part a functional disease. At least, our clinical experience would lead to this supposition, for in two cases that I have been able to examine frequently over periods of years, there have been occasionally spontaneous returns of the gastric juice, in one case twice and in the other once. In both cases it was found only on single examination; that is, there was no persistence in the return; but it is a fair presumption that there were probably many occasions on which secretion was temporarily restored, and occurred when no observations were being made. The fractional test meal seems undoubtedly the only satisfactory method of testing for achylia gastrica. Not infrequently during the first hour no free hydrochloric acid appears, and after that it is secreted in considerable quantities. These, of course, are not cases of achylia. Less frequently one observes that secretion at first fairly abundant disappears entirely before the end of the test; but whether the glands start slowly to secrete or become early exhausted, there can be no question that these cases do not belong in the group of achylia gastrica.

ILLUSTRATIVE CASES

I wish to report particularly as examples two cases with the anxiety neurosis that I mentioned. This seems to be so similar in all the cases, although different in degree, that I believe it characterizes one of the peculiar types of achylia gastrica.

CASE 1.—Mrs. S. E. L., aged about 50, was referred to me by Dr. Charles K. Mills of Philadelphia, who believed that she had some mental disturbances. She had constant mucous diarrhea. The previous history was unimportant. The climacterium had occurred four years previously and without special incident. She complained of a sense of crawling in the stomach. She would eructate several hours after eating, and there was sometimes some burning in the rectum. She vomited only occasionally. Her weight was 138 pounds (62 kg.). The laboratory examination indicated a true achylia gastrica, and with two exceptions at long intervals in a period of fourteen years during which she has been under observation, the achylia gastrica has persisted. Her mental condition was very interesting. She was extremely anxious about her health. She seemed to fear death without any particular reason, and required constant assurance. She cried very easily, suspected her friends, and was afraid to go anywhere alone. Indeed, she feared to be alone at all, and for a number of years required the constant services of a trained nurse. At times she would sleep poorly. She worried continuously about the diet and about the amount of exercise she should take, but apparently was perfectly normal mentally, and managed her estate shrewdly and successfully. She was a tall woman with a large frame, and regarded herself as much underweight.

On treatment she steadily improved, until at the end of about ten years her weight had increased to more than 200 pounds (91 kg.). Her condition had returned to normal. The diarrhea was almost completely controlled, although there were occasional attacks when she would have a number of movements in twenty-four hours for a few days, and the achylia gastrica has remained unaltered.

CASE 2.—W. J. P., aged 48, a salesman, has been under treatment a little more than a year. He complained of chronic diarrhea and mental depression. Although he was greatly worried about himself and feared he would be obliged to give up his work, which was fairly lucrative, and that his wife and children would suffer in consequence, his depression was much less than his curious state of anxiety. His anxiety about his health and his diet was great, much greater than his fear in regard to his financial condition. He particularly dreaded to be alone, fearing that something might happen to him. The result of this was that although he felt great anxiety about his children, he insisted on his wife traveling with him whenever he left the city, leaving the children home in some one else's care.

The physical examination disclosed only the achylia gastrica. This has been persistent in a number of fractional tests that were taken. During the fourteen months he has been under observation his weight has increased from 136 to 148 pounds (from 62 to 67 kg.). His neurosis has practically disappeared. He takes his trips alone and apparently has entire confidence in himself. Nevertheless, the achylia remains unchanged.

TREATMENT

It is of no advantage to multiply these histories. It cannot be as interesting to those who read them as to the one who observes the patients, nor is it possible to impress upon a hearer the extreme state of anxiety these patients manifested, which at times was almost painful. Nevertheless, none of my patients have had hallucinations or delusions. All have been able to attend to their business or other work successfully. None have done anything ridiculous or foolish.

There is little to say about the treatment. Martius,[5] a quarter of a century ago, called attention to the impossibility of replacing the deficient hydrochloric acid. Apparently no patient can endure in the stomach the same amount of hydrochloric acid that would be secreted by the glands. Nevertheless, in these cases hydrochloric acid has always done good, and we can

4. Schoppe: Arch. f. Verdauungskr., October, 1921, p. 289.

5. Martius, F.: Achylia Gastrica, 1897.

only assume that, as the hydrochloric acid stimulates the formation of secretion when applied to the duodenal mucous membrane and in that manner the secretion of the pancreatic juice, so, in the same way, it serves some useful purpose when introduced into the stomach. Jaworski was able to cause the secretion of pepsin in these cases by using a hydrochloric test meal, a fact that I have been able to confirm not only in functional achylia but also in the achylia associated with carcinoma. Consequently, it should be given, and in my opinion the dose is limited only by the capacity of the patient to take it. In one case it was possible for a patient to take 4 c.c. of the dilute hydrochloric acid further diluted after each meal, and in other cases 1 c.c. seems to be all that can be borne. In one case of complete achylia gastrica, associated with pernicious anemia, the patient's tongue always became very sore after he had taken hydrochloric acid for two or three days, whether the hydrochloric acid was administered in water or administered, according to the suggestion of Jacobi, in milk. As a rule, however, the administration in milk is well borne, and enough should be added just to fail of giving a reaction of free acid, which in an ordinary glass of milk is about 2 c.c. of dilute hydrochloric acid.

Whether pepsin should be administered or not, I do not know. The ordinary scale pepsin of commerce has a very definite digestive power. This is less than the digestive power of normal gastric juice, but it may be of use, and I have yet to see any disturbance which pepsin could reasonably be supposed to have caused. It is therefore my custom to combine it with the hydrochloric acid, and in the majority of cases this has been the only treatment employed.

Diet may be briefly dismissed. All foods apparently can be well digested; but in cases of achylia gastrica, foods that are likely to spoil should be excluded from the diet, particularly in hot weather, for undoubtedly these patients are more susceptible to food infection than are ordinary persons well supplied with hydrochloric acid.

DIAGNOSIS

I have of late made some effort to establish a basis for the differentiation between cases of achylia gastrica, early cases of progressive pernicious anemia and cases of achylia gastrica associated with carcinoma. There are no sharp differential features. The following, however, in a small series of cases seem to have been of some use:

The sugar tolerance is lower in nearly all cases of carcinoma. I have tested it in my wards at the Philadelphia and Presbyterian hospitals in all cases of carcinoma, including carcinoma of the head of the pancreas and of the other organs in the abdomen and with or without achylia gastrica. In practically all these cases, sugar tolerance was lower; so considerably lower that it attracted attention. In our cases of achylia this has not been the case. I should hesitate to make a positive differentiation on the basis of this sign alone, but it may be of value in adding weight to other evidence.

In cases of progressive pernicious anemia in which the diagnosis is not definitely established by the blood or other conditions, I have found, even in the early stages, that the vibratory sensation in the bones of the lower extremities is distinctly diminished. Indeed, even fairly early in the course of the disease, it may be completely lost, as it is in tabes. This has not been the case in any patient with the so-called functional or neurasthenic type of achylia. Moreover, in some of the cases of pernicious progressive anemia, we find a pulse that suggests a Corrigan type, and in these cases the blood pressure is higher in the lower extremities than it is in the upper.

Again, the number of cases that I have observed is too small to permit sweeping conclusions. At least the results hitherto have been uniform.

ABSTRACT OF DISCUSSION

DR. FRANK SMITHIES, Chicago: It is very necessary to impress on clinicians generally the advisability of proving that an achylia is an achylia. There is variation in the velocity of secretion, a difference in the rate at which a stomach becomes aroused to excretion after food has been put into it. Not only when test meals have been given, but also in the case of ordinary meals, it is quite likely that in some cases the stimulus to the gastric lining has not been present sufficiently long to arouse the stomach to the production of acid. In other words, the material has left the stomach before it had opportunity to bring about the local reflex. There is a great difference in velocity rates of secretion in the stomach; consequently, when judging a case by the results of the test meals, we sometimes erroneously conclude that the patient is harboring an achylia. It seems necessary to test this patient frequently under the stimulus of a meal which leaves the stomach very slowly, a dry meal. When this is done I think it can readily be shown that many cases of supposed achylia are simply cases of diminished secretion with a decreased velocity. We have never found a subject past the age of 40, when proved in this fashion to have bone achylia gastrica, in whom the acid secretion was later restored. We have had a number of patients below 30 in whom we were not able to secure at one time or another an acid secretion, and yet later there was partial or complete return of the normal acid curve. It is quite likely that during certain stages of disease, especially infectious disease either acute or chronic, there is a diminution or total absence of gastric secretion. In this type of case, the prognosis, of course, is more favorable than in those persons over 40 who have been proved to have a permanent absence of secretion. I agree with Dr. Sailer as to the associated physical upsets in these patients. Some of them have absence of the usual textbook concomitants of achylia gastrica. It seems to me, however, that those patients who have had what might be called a "primary achylia," an achylia due to disappearance or destruction primarily of the secretive mechanism of their glands, do suffer from these classic symptoms, whereas the group of patients who have what might be called a secondary type of achylia, concomitant with systemic disease generally, are persons who do not suffer from the so-called classic symptoms of absence of hydrochloric acid. I have not noted, except as a temporary influence, that a psychic state of the patient bore much relationship to the permanency of an achylia gastrica. But I have been particularly struck by the association of biliary tract affections. Twenty per cent. of cases of gallbladder disease showed permanent achylia gastrica. These patients were usually over 40. One should examine the same patient at different times. I cannot too strongly emphasize this. Having once found that the patient has achylia, one should examine him at intervals to see whether he maintains this condition. Furthermore, do not get into the habit of thinking that merely because a man has a persistent achylia he cannot have such disease as duodenal or gastric ulcer.

DR. SEALE HARRIS, Birmingham, Ala.: One very important point in diagnosing an achylia is not to depend too much on one examination. There should be repeated examinations, made, of course, at different times. By using the fractional tests we shall find some cases in which we would not detect hydrochloric acid by the Ewald method, but after one and a quarter or one and a half hours, hydrochloric acid is found. In a number of cases I have been interested to note that in thirty or forty-five minutes the patient would show

a secretion of hydrochloric acid, in an hour no hydrochloric acid, and then in an hour and a quarter or an hour and a half it would again be found. Dr. Sailer states that the majority of his patients with achylia were constipated. I am not quite sure that that is true in my cases, because I see many cases of diarrhea in which achylia is present, and in that type I frequently find intestinal parasites, particularly *Trichomonas intestinalis;* and in some cases of achylia I find constipation with those parasites present. I have felt that in some cases the administration of hydrochloric acid helped in removing or reducing the intestinal parasites found in the stools. As to the association of achylia and pernicious anemia, I have seen one such case.

DR. A. L. LEVIN, New Orleans: Achylia gastrica is a very puzzling problem in gastric pathology. We often see persons with achylia who get along nicely without any discomfort whatever; then, again, another victim of this disease will suffer greatly. I feel that the lack of hydrochloric acid in the gastric juice is probably due to some disturbing influence, whether faulty metabolism causing disturbance in the sodium chlorid content of the body, a diminution or otherwise, or something else. Luckhardt injected gastrin hypodermically; and by taking the reading of the hydrochloric acid before and after injecting it, he showed conclusively that by this means he had doubled the quantity of hydrochloric acid in the animal. I question whether this would not be of value in cases of achylia gastrica. I agree with Dr. Smithies as to the association of biliary tract disease with this condition. My observations lead me to believe that in a large number of cases of gallbladder disease we find disturbance of hydrochloric acid secretion. In 1916 Fravel conducted some experiments on dogs, obtaining the hydrochloric acid reading before he removed the gallbladder, and again studied the hydrochloric acid in the stomach. In all of the sixteen dogs on which the experiment was made he found that either the amount of hydrochloric acid was diminished or there was an achylia. This would serve as a caution to the surgeon to practice conservatism in gallbladder surgery because this organ has some bearing on the amount of hydrochloric acid secreted in the stomach.

DR. ARNO B. LUCKHARDT, Chicago: I have no experimental evidence relative to the cause of achylia gastrica. So far as I know, that condition cannot be produced experimentally in the animal. I shall leave the question of pancreatic and gastric secretion without comment, but should like to ask Dr. Sailer this: If the pancreatic secretion is formed as he stated, under the influence of free acid in the duodenum or because of the presence in the duodenum of free hydrogen ions, how can he expect to get increased secretion of pancreatic juice by the administration of hydrochloric acid whose free acidity he has neutralized by mixing it with proteins such as are contained in milk?

DR. H. W. SOPER, St. Louis: A differential diagnosis between true achylia gastrica and an acid gastritis is of extreme importance, and study of the cytology of the fasting stomach contents will usually establish the diagnosis. The progress of a case of achylia largely depends on the integrity of the mucosa of the small intestine. Therefore dietetic measures are always of importance in achylia in order to protect the small intestine. The patients with achylia that do not do well usually show a catarrhal condition of the small intestine, which can be demonstrated by frequent analyses of the feces.

DR. A. J. CARLSON, Chicago: I should like Dr. Sailer to speak more to the point on "pepsin achylia." I understood him to say that the decrease of pepsin runs parallel with the decrease of hydrochloric acid. On the experimental side there is evidence that the secretion of pepsin is largely independent of the secretion of hydrochloric acid. We can obtain gastric juice that has no free and little or no combined acid, but is higher in pepsin than is the normal gastric juice. It is supposed that some cases of achylia are congenital. There are probably some that have an organic cause, namely, atrophy of the gastric mucosa. I understand that he was inclined to classify all of them as functional. I hope Dr. Sailer is taking steps to follow his persistent achylia to postmortem. These people do not die of achylia. But chemical and histologic studies of the gastric mucosa would help to decide the question of functional or organic etiology.

DR. JOSEPH SAILER, Philadelphia: I do not think the diagnosis of achylia can be based on a single examination or on a single test meal. I have taken the gastric contents in cases in which the gallbladder has been removed, and found no evidence of achylia. I do not believe that the administration of hydrochloric acid, either alone or in milk, was the cause of the secretion of the pancreas. It is a problem for the physiologist, for the duodenal contents removed before the patient has taken hydrochloric acid contain pancreatic ferments. The only way I know of whereby we can demonstrate the existence of pepsin is the evidence of digestive activity in an acid solution. And in none of the cases I have chosen to use in my study of achylia gastrica has there been any evidence of digestive activity. On the other hand, it is sometimes possible to obtain digestive activity in these cases by acid test meals. Achylia gastrica probably has nothing whatever to do with what one might possibly call a paroxysmal suspension of gastric juice, which I am sure ocurs rather frequently. The diagnosis of achylia gastrica does not include the cases first described by Fenwick, which were undoubtedly cases of pernicious anemia. Achylia gastrica, as far as we know, is not itself a fatal disease. Referring to Dr. Smithies' remarks, a patient whom I have examined at frequent intervals for a period of fourteen years, and in whom on two occasions hydrochloric acid and pepsin were found in the gastric secretion on examination, now has no hydrochloric acid. I see her only infrequently because she feels perfectly well. She is now about 54, well above the age that has been mentioned. Therefore, if that patient could on two occasions secrete hydrochloric acid, it seems reasonable to suppose that total functional absence of secretion of hydrochloric acid can be present in such cases.

SOME OPHTHALMOLOGIC MANIFESTATIONS OF DISEASES OF THE NERVOUS SYSTEM *

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The ophthalmologic manifestations of diseases of the nervous system have long occupied a conspicuous place, and have been studied with great interest by the neurologist and the ophthalmologist.

Realizing the close relation existing between the eye and the brain, the retina being an outgrowth from the rudimentary brain of the primary optic vesicle, and the optic nerves being portions of the lobes of the brain,[1] and admitting that these anatomic and embryologic facts are true, one readily realizes how the early manifestations of diseases of the brain may reveal themselves through the medium of the eye, which is the principal means we have of noting the changes resulting from disease of this organ. On examining the eye, we are able, in many cases, to see these changes in their incipiency, and thus make an intelligent diagnosis of the workings of this great machine (consisting of 600 million cells) before the disease has progressed to a point beyond all hope of medical or surgical intervention.

Assuming that the eye is a portion of the brain, then diseases of this complex machine will, in many instances, reveal early changes in the visual organs by alteration in the normal physiologic functions which

* Read before the Section on Ophthalmology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. Church and Peterson: Textbook of Nervous and Mental Diseases, 4: 95, 1910.

manifest themselves by organic changes in the anatomic structure of the eye and visual pathways; or, by functional derangement of its mechanism.

In this paper I do not propose to go deeply into any particular disease, many of which the variegated symptomatology and diversity of syndromes would carry one far into other fields to describe. I will, therefore, limit myself to the discussion of a few common diseases of the nervous system, and attempt to give the eye signs encountered in each, with an outline for examination that I use, adopted after Holden.[2] By following carefully this method of examination one is able to make an intelligent observation, and on the correlation of the findings, arrive at a satisfactory diagnosis. Etiologic and pathologic changes that ensue, I will not discuss in detail, but will touch on them only when necessary. The following outline is of particular value:

1. Sensibility of the cornea.
2. Size, shape and reaction of the pupils.
3. Abnormalities of the extra-ocular muscles, squint, nystagmus or paralysis.
4. Visual acuity near and distant.
5. Visual fields.
6. Examination of fundi, noting condition of optic disk as regards atrophy, edema or alterations in the blood vessels.
7. Any abnormality, such as exophthalmos, ptosis of the lids, inflammation, operations or injuries.
8. Convergence reaction, especially noting whether there is paralysis of convergence or divergence.

Corneal sensibility is tested by gently touching the cornea with a piece of absorbent cotton twisted to a thread, noting the discomfort experienced and the rapidity with which the patient winks, and thereby readily noting any loss of function in the ophthalmic division of the fifth nerve. If winking reaction is slow or absent, we immediately think of: (*a*) section of this branch; (*b*) herpes zoster involving this branch; (*c*) the use of some drug in the eye, such as cocain. If sensibility is diminished and unilateral, without facial hyperesthesia, it may mean tumor of the cerebellum on the same side. In these cases, we should look for an accompanying nystagmus, which is of the course type and to the same side; an unstable gait, and a tendency to fall to the same side.

Hysteria may cause hyperesthesia of one or both corneas, with accompanying sensory disturbances of other parts of the body, often with equal pupils and negative fundus findings.

As for the size and reaction of the pupils, inequality of pupils is always pathologic. Contraction of pupils takes place through the third nerve; dilatation through the sympathetic ciliospinal center. The average pupil should measure about 4 mm. in diameter, allowing for old age, during which time its diameter is diminished.

When the pupil is dilated, one should think of mydriatics, myopia, excitement or emotion, irritaton of the sympathetic nerves or paralysis of the third nerve. When the pupil is contracted, one should think of myotics, irritation of the third nerve or inhibition of the sympathetic. Normally, the pupil contracts to light, accommodation and convergence; however, disturbances in the motor portion of the reflex path of the third nerve may prove an exception. If such disturbance is in that portion of the reflex path which lies between the optic nerve (centripetal limb) and the third nerve (centrifugal limb), we find that the reaction of convergence and accommodation is maintained, while the reaction for light is absent (Argyll Robertson pupil, so often associated with tabes and progressive paresis). This has also been found in certain tumors located in the region of the third ventricle. By pressure, these growths may produce similar findings. Attention is called to the cases in which there is contraction of the pupil to light, but the patients are not aware of the presence of light. To these belong the type in which there are lesions high up in the optic pathway above the connecting fibers between the optic and third nerve.

We also find patients that show normal reaction to light and accommodation, but a complete paralysis of convergence, and all extra-ocular muscles functioning normally. Regarding the frequency of convergence paralysis as an early manifestation of disease of the nervous system, I should like to say a few words. The causes are many. Posey and Spiller [3] give as causes: tabes, multiple sclerosis (in 3 per cent. of cases), and probably other organic nervous diseases. Parinaud [4] and Uhthoff [5] point out that paralysis of the power of convergence, partial or complete, without disturbance in lateral movements, is a form of nuclear palsy which is often found in disseminated sclerosis. I have found this condition associated with syphilis, migraine and intestinal toxemia. In the last two conditions, it is usually of transitory nature. As to the localization of the lesion giving rise to this condition, many theories have been advanced, but few facts have been given to substantiate them. It is thought by many that disturbances in the region of Deiter's nucleus in the medulla oblongata may give rise to this symptom. Bernheimer believes that the anatomic site of the lesion is probably in the fibers connecting the nondecussating fasciculi of the two internal recti nuclei with each other, or connecting these fasciculi with the cortex. Edinger's views, as presented in the seventh edition of his lectures on the structure of the nervous system, are that the center of convergence may be formed by the large cell median nucleus of the ocular motor nerve, associated with the nerve cells for the rectus internus which lie on each side and near the median nucleus, and that these three groups together may form a center for convergence; while Marina's [6] investigations have made the existence of such a center in the oculomotor nucleus seem doubtful. The majority of us, however, will admit the existence of such a center, wherever it may be.

I have found six patients showing this condition, two acknowledging syphilis and having + + + + Wassermann reactions, and two suffering from gastro-intestinal toxemia with negative Wassermann reactions. The fifth had a negative venereal and family history, and no cause for this condition could be determined. The sixth suddenly developed a dilated pupil on the left side with loss of reaction to light and accommodation and an accompanying convergence paralysis. The Wassermann reaction was doubtful.

The examination of the ocular muscles is of great importance in the early diagnosis of diseases of the central nervous system. It is well to notice the position of the eyes in the primary field, and to have the patient perform the associated movement tests in the six cardinal positions. If diplopia is found, the tangent screen, with a red glass in front of one eye, readily

2. Holden, W. A.: The Eye in Nervous Diseases, Arch. Ophth. **47**: 22 (May) 1918.

3. Posey and Spiller: The Eye and the Nervous System, **4**: 259, 1906.
4. Parinaud: Paralysie de la convergence, Progrès méd. May 8, 1886.
5. Uhthoff: Arch. f. Psychiat. **21**: 382, 1893.
6. Marina: Neurol. Centralbl., Sept. 1, 1904, p. 797.

enables one to locate the muscle or muscles involved, and in this way, phorias, trophias and paralytic deviations may be differentiated. One or more ocular muscles may be involved very early, and frequently diplopia is one of the first symptoms complained of, and may be a forerunner of a grave disease of the brain. This is especially true in lethargic encephalitis. In this condition, the prodromal symptoms are usually diplopia, perhaps associated with a headache or general bodily weakness. On examination, there is often found paresis or a true paralysis of one or more of the ocular muscles, and an associated sluggishness of accommodation.

I do not recall seeing a case of this disease in which, at one time or another, the patient did not have symptoms of diplopia. In the ocular muscle palsies, the site of the lesion is, as a rule, in the nucleus of the supplying nerve or its trunk, and, of all the muscles of the eye, the external recti are the most frequently involved, chiefly because of the long basilar course of the sixth nerve. Next in order come the muscles supplied by the third or ocular motor nerve; and, lastly, the superior oblique muscle, which is innervated by the fourth nerve.

In cases of intracranial pressure, the external rectus is frequently involved; this, however, is of little value in localizing the site of the lesion. The cause of this early and frequent involvement is thought to be compression of the nerve trunk by a cerebellar artery (Cushing).

In lesions involving the nucleus of the third nerve, we may have, as a resulting condition, ophthalmoplegia external, internal and totalis. In the former case, the sphincter muscle and muscle of accommodation are not involved. We often encounter isolated paralysis of the muscles supplied by the oculomotor nerve, and which are not of nuclear origin. This may be explained by the fact that the fibers forming the third nerve are not closely united at the point of exit of the nerve from the cerebral peduncle, and it is because of this that paralysis of one or more of the muscles innervated by the nerve may be encountered in basilar meningitis without paralysis of the whole muscular supply of this nerve.

We rarely encounter paralysis of the superior oblique, but when found it usually is of basilar origin. However, it has been found in relation to tumor in the pineal gland.[7]

When conjugate deviations are noted, we may readily assume that the lesion is central. The causes of this condition are many; namely, apoplexy, epilepsy, or certain tumors of the brain, etc. It is not necessary to discuss the question of the value of testing the visual acuity, as it is important to correct any refractive error so that we may be sure the reduction of vision is not due to this cause. A routine examination of the fundus, preferably under a mydriatic, often gives us the true picture of the changes with which we are confronted and what to expect. It also enables us, in many cases, to make an accurate diagnosis; to give the neurologist information which may help him to localize the causative lesion, and an opinion as to the necessity for surgical intervention; and, lastly, to furnish a fair prognosis as to the probability of blindness.

Perimetry is of untold value; therefore, a careful perimetric test should be made in every case, and an accurate record of the findings kept. By so doing, we can check up the findings formerly made, and in this way map out islands of blindness and accurately determine the extent of involvement. We are also able by this method to make a differential diagnosis in many cases, and frequently, before visible changes in the nerve head are perceived with the ophthalmoscope, are further able to make fairly accurate localization of the lesion with the perimeter, and to differentiate the organic from the functional.

Before reporting several cases, I should like to discuss briefly the condition that is commonly termed migraine, or scintillating scotoma. This condition, which I define as a neurosis characterized by paroxysmal attacks of headache, preceded by visual disturbances bizarre in character, is thought by many to be of hereditary origin, closely resembling epilepsy, and caused by a disturbance in the circulation of the blood vessels of the brain, probably an angioneurosis of the vessels in the calcarine cortex. However, whether it is hereditary or allied to epilepsy, I am not prepared to say.

It has been my experience to find that these cases of migraine have, as a contributory cause, eye strain, produced by small refractive errors; frequently astigmatism, against the rule, or one or the other cylinder off axis. In other cases, I have found a history of gastro-intestinal toxemia with constipation.

In no way am I trying to discredit or attempting to disprove any statements made by well known authorities who have gone much farther and deeper into the question of the etiologic factors underlying this condition; but I am speaking only from observations I have made.

I have found, associated with the visual disturbances, one case that presented distinct paralysis of convergence, which was transitory in character. The patient, on the subsiding of the attack, was found to have binocular single vision, thus showing that whatever the etiologic factor may have been, the visual centers were in some way affected, as well as the center of convergence.

Having had the opportunity of closely studying one patient, during an attack, while taking the visual field and making a fundus examination, I found that he was not only apathetic, but frequently called things by the wrong name (psychic migraine). This condition has been described in detail by Liveing[8] and Oppenheim.[9] The only way in which I could account for these symptoms was by the extension of the angioneurosis to other areas of the brain. When taking the fields, at different intervals, of two patients, the frequency of left homonymous hemianopsia was noted and I thought I had made a discovery. A few days later, one of these patients had another attack, and when taking the fields I was surprised to find a right homonymous hemianopsia.

The onset of these attacks is described vividly in many cases, from a beginning with zigzag lines and many colored lights, to a blurring of portions of objects. The latter was found to be the most common type, the blurring gradually progressing to the point of blotting out of definite areas of the fields, and at times taking the form of homonymous hemianopsia, more intense on one side than another. As the attack progresses, there is a constriction in the corresponding

7. Nieden: Neurol. Centralbl., 1879, No. 8.

8. Liveing: On Megrim, Sick Headache, and Some Allied Disorders, London, 1873.

9. Oppenheim: Diseases of the Nervous System, translated by Mayer, 1900, p. 751.

fields. Such an attack, as a rule, does not last longer than thirty or forty minutes, and with the wearing off of the visual disturbance the headache follows.

With the subsiding of these visual disturbances, I have seen the paralysis of convergence remain for forty-eight hours, and when this condition had passed, the patient had orthophoria with perfect fusion of images.

REPORT OF CASES

CASE 1.—*Migraine associated with astigmatism against the rule, convergence insufficiency and history of gastro-intestinal toxemia.* J. P., man, aged 29, white, had attacks of headache and blurred vision, associated with dancing lights in front of the eyes. These attacks came on, as a rule, after the patient had been reading or studying. The family history was negative; the patient had had the usual diseases of childhood; the venereal history was negative. The patient used tobacco moderately, had a good appetite, and slept well. He suffered from intestinal stasis and indigestion. Examination of the eyes revealed vision of 20/20 in each eye. Fundi and media were normal and clear. Examination of extra-ocular muscles revealed 12 degrees of exophoria for near, with a remote near point. Retinoscopy revealed O. D. + 0.25 C. ax. 40, O. S. — 0.25 sph. + 0.50 C. ax. 180. With the foregoing correction, the patient read 20/15. In the examination of visual fields, the first field, which was taken Aug. 1, 1920, about twenty minutes after the attack of blurred vision had started, showed left homonymous hemianopsia with a restriction in the corresponding halves in both fields. As the attack progressed, the entire fields of both eyes were contracted to within 30 degree limits, after which there was found to be a sudden cessation of the blurring experience, and the fields cleared rapidly.

October 5, thirty minutes after an attack of blurred vision, the visual fields showed right homonymous hemianopsia, with restriction of the corresponding fields. The fields taken between the attacks were found to be normal, and no enlargement of blind spots was noted. The patient's refractive error was corrected and he was advised to wear his glasses constantly. Convergence exercises were started and careful attention to the diet and the gastro-intestinal tract was advised, with the result that the attacks that used to occur at frequent intervals have not occurred in a period of several months. This, to my mind, was a case of migraine, largely due to a refractive error associated with an ocular muscle insufficiency, intensified by gastro-intestinal disturbance.

CASE 2.—*Paralysis of convergence, probably of syphilitic origin.* E. H., man aged 41, colored, who complained of double vision, gave a history of rheumatism. Venereal disease was denied. The present trouble started three years previously, following an attack of rheumatism. The patient began to see double at that time and the condition had grown worse. Examination revealed: Vision, right eye, 20/100; left eye, 20/70; corrected to: right eye, 20/20, with a + 0.50 sph. + 0.75 C. ax. vertical; left eye, 20/20, with a + 0.70 sph. + 0.50 sph. ax. vertical. The fundi and media were normal. Pupillary reactions were normal to light and accommodation. The near point of accommodation was 22.5 cm., in each eye. Extra-ocular muscle movements were normal in all fields. Exotropia was 14 degrees for near, 1½ degrees for distance. The tangent screen revealed crossed diplopia in primary fields, not increasing in other fields. The patient was unable to converge to the slightest degree. The neurologic examination was negative, except for some inequality of the knee jerks. Roentgen-ray examination of the skull, and paranasal sinuses was negative. The blood Wassermann reaction was positive. This was a case of convergence paralysis and, in my opinion, was due to syphilis. The patient was put on mixed treatment and intravenous injections of arsphenamin. His condition has remained stationary.

CASE 3.—H. J., man, aged 22, colored, who complained of double vision, presented a negative family history. His present history was negative and venereal history was denied. The present trouble dated back seven years, when the patient had suddenly noticed that objects appeared double. The condition had progressed very slowly. Examination revealed vision, 20/20, in each eye. The fundi and media were clear. The pupils reacted to light and accommodation. The near point of accommodation was 12 cm., in each eye. The near point of convergence was 225 cm. Examination of the extra-ocular muscles revealed 7½ degrees of exotropia for near; orthophoria for distance. Associated movements tested normal in all positions. There was no individual muscle paralysis. The tangent screen revealed crossed diplopia in the primary field, remaining the same in all other fields. The neurologic report was negative. Roentgen-ray examination of the skull failed to reveal any pathologic findings. The paranasal sinuses were negative. The blood Wassermann reaction was positive. The patient is receiving intravenous injections of arsphenamin and mixed treatment, and his condition has, to date, remained stationary, with no improvement of ocular symptoms.

CASE 4.—S. A., woman, colored, aged 46, suddenly developed a dilated pupil on the left side, with inability to fuse objects. The past history was of no consequence; venereal history was denied. Examination revealed fundi and media clear and normal. The right pupil reacted to light and accommodation, and was normal in size. The left eye showed complete internal ophthalmoplegia, with a fixed pupil that did not react to light and accommodation. The consensual reflex from right to left was absent, from left to right present. Examination of extra-ocular muscles revealed no individual muscle paralysis. There was crossed diplopia in the primary field, not increased in any other field. The near point of convergence was 150 cm. The blood Wassermann was questionable. This, I think, should be looked on as a case of convergence paralysis associated with an ophthalmoplegia interna. It tends to substantiate the teachings of Edinger in locating the center of convergence in close proximity to the nucleus of the ocular motor nerve. As to the doubtful Wassermann reaction, I am skeptical. However, the left pupil returned to normal size in less than two weeks' time, under an intensive course of treatment of mercury and iodid.

CONCLUSION

A routine examination, similar or as outlined, should be adhered to in the examination of every patient. If this is done, an insight may be gained, in many cases, into the condition of the central nervous system.

Every patient complaining of headache, especially of migrainous type, should undergo refraction and the diet should be regulated or watched, as this condition is frequently due to an astigmatic error or some disturbance in the gastro-intestinal tract. In the examination of the ocular muscles, it is well to bear in mind the importance of convergence paralysis, as it is a symptom more common than is generally believed, and frequently of syphilitic origin.

ABSTRACT OF DISCUSSION

DR. J. M. BANISTER, Omaha: I should like to mention one point, and that is the subject of scintillating scotoma or fugacious lateral homonymous hemianopsia. The internist is singularly deficient in his knowledge of this frequently alarming condition and the ophthalmologist is often called on to make the decision as to the gravity or seriousness of a case manifesting the characteristic symptoms. Hemianopsia may be divided into two general classes—the permanent type from a definite organic lesion, and the temporary type. In cases of temporary lateral homonymous hemianopsia the causative angioneurotic is on only one side of the brain. It is our business to make a practical diagnosis and let the patient understand that in these seizures there is merely a temporary loss of vision. This condition is due to a toxemia resulting from intestinal autointoxication or from some focal infection, possibly of the teeth or nasal accessory sinuses. I have lately operated in two marked cases of the latter type in which the foci of infection were located in the antrums. This temporary hemianoptic condition is due to a spasm of the branches of the posterior cerebral artery on the affected side of the brain. The toxemia is the exciting cause of this vasomotor constriction.

STUDIES ON THE RELATION OF THE THYROID TO PANCREATIC DIABETES IN DOGS

WITH SUGGESTIONS AS TO DIABETES MELLITUS IN MAN *

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Little doubt as to the pancreatic origin of diabetes mellitus remains, since Weichselbaum [1] demonstrated, by special staining methods in all diabetics from his large necropsy material, definite changes in the islands of Langerhans, and since Cecil [2] noted similar changes at necropsies in seventy-nine of his ninety diabetics.

The fact, however, that glycosuria and hyperglycemia may be transient in some persons favors the assumption that anatomic changes in the islets must not necessarily be present in mild cases of the disease. Emotional causes may lead in some persons to a transient glycosuria, especially in those with a congenital inferiority of the pancreas. A temporary disturbance in the insular apparatus also occurs during infections, as in the course of chronic cholecystitis. Various drugs also may have this effect. Last but not least, certain endocrine disorders, such as hyperpituitary and hyperthyroid states, will occasionally lead to glycosuria and even to true diabetes mellitus. As actual pathologic changes in the islands were hardly ever found in acromegaly and in exophthalmic goiter, one must assume that in these maladies the insular apparatus is disturbed functionally.

The relationship between thyroid diseases and diabetes mellitus was first pointed out by Dumonptallier [3] in 1867. He described a case of exophthalmic goiter and diabetes in a young woman. Since that time similar cases have been reported from time to time. However, Fitz [4] and Sainton [5] and his associates emphasize the rarity of the two maladies combined in one person, and both consider such a combination as a mere coincidence. Holst [6] reports eight cases of exophthalmic goiter with not only alimentary but also spontaneous glycosuria, including three cases which must be considered as a combination of exophthalmic goiter and diabetes. From this and other data cited in his paper, he draws the conclusion that tests for sugar should be applied as a routine measure in cases of hyperthyroidism, and that diabetic patients should always be examined for hyperthyroid symptoms.

Although every clinician will admit that spontaneous glycosuria, as well as fasting hyperglycemia, are rare occurrences in hyperthyroid states, yet alimentary glycosuria in the latter conditions may be considered as common. Low sugar tolerance was reported by Denis [7] and her associates in all their cases of hyperthyroidism, and recently it was corroborated by Morris [8] and others. It is also a well established fact that, in true myxedema, the assimilation limit for dextrose is high. Experimentally, it was shown by McCurdy [9] and others that dextrose tolerance was high in thyroidectomized dogs, and if the parathyroids were preserved, the results were permanent. This does not exist in hypothyroid conditions. Garrod [10] refers to the occurrence of glycosuria and even of true diabetes in subthyroid persons. From these considerations one is justified in concluding that, while thyroid overactivity does not lead to definite pathologic changes in the insular apparatus, it leads to a functional disturbance in the latter, as evidenced from the low sugar tolerance in hyperthyroid states. The high sugar tolerance in athyroid conditions must be credited with a functional disturbance of reverse nature. Various degrees of thyroid hypo-activity do not suffice to upset the islands of Langerhans in the same manner as in myxedema.

It is but logical to assume that a functional disturbance in the thyroid may be a possibility in diabetes mellitus. We speak of a functional disturbance of the pancreatic islets in exophthalmic goiter and of a similar disturbance of the thyroid in diabetes because a thorough search through the literature does not reveal sufficient data as to the actual pathologic condition of the pancreas in the former condition, nor to thyroid changes in the latter. Garrod,[10] while stating that glycosuria may exist in conjunction with thyroid deficiency, admits knowledge of a few cases in which exophthalmic goiter was associated with atrophy and other lesions of the pancreas. According to Holst,[6] in nine cases of exophthalmic goiter recorded, the pancreas was pathologic. Just as little is known about thyroid changes in diabetics. Cecil [11] writes that adenoma of thyroid glands has been noted in the anatomic diagnosis of two cases of diabetes. But it is rather strange that in these cases the pancreatic islets were hyperthophied, a seemingly paradoxical histologic picture of the pancreas in diabetics, though described by MacCallum [12] and others. Kraus [13] speaking of the changes in the pars media of the hypophysis in diabetes mellitus, cites several cases in which the pathologic picture of the thyroid was interpreted by him as corresponding to overactivity of the thyroid. Few investigators studied the thyroid microscopically in depancreatized dogs. Lorand [14] asserts that the histologic picture of the thyroid in diabetic dogs must be interpreted as overactivity. Licini [15] described the thyroid in experimental diabetes as presenting the colloid type, which may occasionally be seen in exophthalmic goiter. He emphasizes overactivity of the thyroid in his dogs and states that endemic goiter did not exist in the locality from which his animals were procured.

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1. Weichselbaum, quoted by Pratt, J. H.: Internal Function of Pancreas, J. A. M. A. **59**: 322 (Aug. 3) 1912.

2. Cecil, R. L.: A Study of the Pathological Anatomy of the Pancreas in Ninety Cases of Diabetes Mellitus, J. Exper. Med. **11**: 266, 1909.

3. Dumonptallier: Goitre exophthalmique et glycosurie chèz la même malade, Compt. rend. Soc. de biol. **4**: 116, 1867.

4. Fitz, Reginald: The Relation of Hyperthyroidism to Diabetes Mellitus, Arch. Int. Med. **27**: 305 (March) 1921.

5. Sainton, P.; Schulmann, E., and Justin-Besançon: Bull. et mém. Soc. méd. d. hôp. de Paris **45**: 1298 (July 29) 1921.

6. Holst, J.: Glycosuria and Diabetes in Exophthalmic Goiter, Acta med. Scand. **55**: 302 (June) 1921 (in English); abstr. J. A. M. A. **77**: 744 (Aug. 27) 1921.

7. Denis, W.; Aub, J. C., and Minot, A. S.: Blood Sugar in Hyperthyroidism, Arch. Int. Med. **20**: 964 (Dec.) 1917.

8. Morris, M. F., Jr.: Value of the Alimentary Test in the Diagnosis of Mild Hyperthyroidism, J. A. M. A. **76**: 1566 (June 4) 1921.

9. McCurdy, J.: Influence of Thyroidectomy on Alimentary Glycosuria, J. Exper. Med. **11**: 798, 1909.

10. Garrod, A. E.: Glycosuria, Lancet, March 9, 1912.

11. Cecil, R. L.: The Effect of Certain Experimental Procedures on the Islands of Langerhans, J. Exper. Med. **16**: 1, 1912.

12. MacCallum, W. G.: Hypertrophy of the Islands of Langerhans in Diabetes Mellitus, Am. J. M. Sc., March, 1907.

13. Kraus, E. J.: Hypophyse und Diabetes Mellitus, Virchows Arch. f. path. Anat. **228**: 68-133, 1920.

14. Lorand, A.: Les rapports du pancreas (Islets of Langerhans) avec la thyroide, Compt. rend. Soc. de biol. **56**: 488-490, 1904.

15. Licini, C.: Einfluss der Exstirpation des Pancreas auf die Schilddrüse, Deutsch. Ztschr. f. Chir. **101**: 4, 5 and 6, 1909.

Pratt [16] is rather careful in commenting on the histologic picture of the thyroids in his depancreatized animals. The glands of three dogs, in whom pancreatic insufficiency without glycosuria had existed from five to thirty-four months, presented the normal size, color and consistency. The histologic study, however, revealed either a partial or total disappearance of colloid, and in its place were desquamated epithelial cells, so numerous as to fill many of the alveoli. The cells varied in size, but large ones predominated. The nuclei took the stain deeply and uniformly. Pratt is in doubt as to whether the changes he discovered indicate a compensatory action on the part of the thyroid or whether they presented merely a degenerative state.

As the histology of the thyroid in our depancreatized dogs will be referred to in another paper, it should be stated here that there is no uniform histologic picture, even in exophthalmic goiter. Kocher [17] and Marine [18] have described three types in this malady: the hyperplastic, the colloid, and the hyperplastic and degenerative. It may also be mentioned that sufficient information cannot be obtained by studying thyroids from depancreatized dogs microscopically. The determination of the iodin content of the thyroids of depancreatized animals may lead to a better understanding of the part taken by the thyroid in diabetes mellitus. Such investigation has been started by us.

From all the considerations of the relationship of the thyroid to the pancreas, two statements may be considered as absolutely certain: that overactivity of the thyroids leads to a lowering of the assimilation limit of dextrose, and that complete atrophy of the gland raises it. Myxedematous persons are not likely to become diabetic.

It is highly probable that the difference in the severity of the clinical course in diabetes mellitus at various ages depends in a measure on the difference, with age, in the physiologic functioning of the thyroid. In infancy, the epithelium of the thyroid is of a columnar type, according to Marine,[19] Kocher [20] and Jackson,[21] in adolescence the epithelium is cubical, and in elderly persons, flat. It is well known that diabetes takes a very severe course in children; the disease is severe in adults but extremely mild when acquired in old age. The mortality from diabetes mellitus in children is almost 100 per cent., in spite of advanced modern treatment; and if Riesman [22] has observed several cures in children, he himself admits that the diabetes in them was of renal origin. The mortality from diabetes is still high in adolescence.

It seems, then, that the tendency of the thyroid to physiologic atrophy may be the determining factor for the mild course of diabetes in elderly persons. The absence of diabetes in true myxedema and the mild course of diabetes in advanced age are suggestive of a cure for diabetes by inducing a complete atrophy of the thyroid. If this is true, it would be reasonable to assume that a spontaneous cure of diabetes is occasionally possible through an atrophic state of the gland, brought about by unknown causes.

In connection with this point of view, one of Rohdenburg's [23] cases may be cited:

> A Russian Jewess, aged 45, married and having five children, was examined for insurance when 30 years of age, and sugar was discovered in the urine. Treatment was of no avail. The menopause was very stormy from 39 to 41. After this, it was accidently discovered that the sugar had disappeared. The patient was then able to eat candy with impunity. Death occurred at the age of 45 with what resembled chronic nephritis, though it was evident that there was also myxedema. The necropsy revealed almost complete fibrosis of the thyroid, fibrosis of the major portion of the head of the pancreas, hypertrophy of the islands of Langerhans in the middle portions, a normal pancreatic tail, marked arteriosclerosis, and marked interstitial nephritis.

As true myxedema is hardly ever combined with diabetes mellitus; as the course of diabetes is mild in elderly persons, and since a spontaneous cure of the disease is possible through atrophy of the thyroid, the possibility of observing the disappearance of glycosuria in depancreatized dogs, either after ligation of all thyroid arteries, or after removal of the thyroid gland in toto, suggested itself to us. One could not expect to observe an increase in weight of depancreatized animals after these procedures, as it is well known that total or nearly total extirpation of the pancreas leads to enormous losses in body weight in every case.

At the present stage of our knowledge, we do not possess means to destroy only the insular apparatus of the pancreas, leaving the external secretory apparatus intact; so one can imitate human diabetes only to some extent by the experiment. Complete removal of the pancreas always leads to glycosuria and hyperglycemia. To produce glycosuria after partial pancreatectomy, one must remove a little more than 2 gm. for each kilogram of body weight of the animal in the majority of cases. While one may occasionally succeed in obtaining persistent glycosuria by removing less than this amount, hyperglycemia without glycosuria manifests itself almost always after removal of small amounts of pancreatic tissue.

Of fifty dogs which we depancreatized from January, 1921, to May, 1922, persistent glycosuria became evident after removal of 1.3 gm. in one dog and, in another, after extirpation of 1 gm. per kilogram of body weight. As the latter animal's digestion did not suffer from a lack of pancreatic ferments, we believe that, by chance, we imitated true human diabetes. This information is by no means new since, in the literature on experimental diabetes, reports have frequently appeared pertaining to induction of diabetes in dogs by removal of comparatively small amounts of pancreatic tissue.

The duration of life in diabetic dogs, after complete thyroidectomy, is greatly shortened, as is evidenced by the experiments of Lorand, MacCallum and Eppinger, quoted in a previous paper.[24] Our own diabetic dogs in which the thyroid was removed in one sitting also died in from two to three days after thyroidectomy. Complete ligation of the thyroid arteries, or, better still, partial ligation followed at a later date by complete thyroidectomy, enabled us to keep the animals alive

16. Pratt, J. H.: (Footnote 1).
17. Kocher, Albert: Die histologische und chemische Veranderung der Schilddrüse, Virchows Arch. f. path. Anat. **208**: 86-296, 1912.
18. Marine, David, and Lenhart, C. H.: Pathologic Anatomy of Exophthalmic Goiter, Arch. Int. Med. **8**: 265 (Sept.) 1911.
19. Marine, David, quoted by Jackson, C. M.: Effects of Inanition on Structure of Thyroid and Parathyroid Glands of Albino Rat, J. Anat. **19**: 305 (March) 1916.
20. Kocher, Albert: Morbus Basedowii, in Kraus und Brugsch: Spezielle Pathologie und Therapie innerer Krankheiten, Berlin and Vienna, Urban and Schwarzenberg **1**: 909, 1919.
21. Jackson, C. M.: (Footnote 19).
22. Riesman, D.: Mild Diabetes in Children, Am. J. M. Sc. **151**: 40-44 (Jan.) 1916.
23. Rohdenburg, G. L.: A Case of Spontaneous Disappearance of Diabetes, Endocrinology **6**: 519 (July) 1922.
24. Friedman, G. A., and Gottesman, Julius: Relation of Thyroid and Parathyroids to Pancreatic Diabetes in Dogs, Proc. Soc. Exper. Biol. & Med. **19**: 215-221, 1922.

for a longer period of time, and greatly extended the time of observation.

Recently we performed thyroidectomy in hyperglycemic dogs in two sittings, but during the second lobectomy we left a tiny piece of the thyroid tissue in situ. In performing a thyroidectomy, one only occasionally succeeds in sparing all parathyroids, so that tetany ensues. The occurrence of tetany is less frequent after total ligature of the vessel than after thyroidectomy.

Diabetic dogs are more liable to be affected by tetanic seizures with two or three parathyroids left in situ, than are nondiabetic dogs with the same number of parathyroids.

During the time of observation, all the dogs were on the routine laboratory diet, consisting of bread, meat and carrots. Blood sugar estimations were made by the Lewis and Benedict method, by Miss Helen Emmons.

RESULTS OF EXPERIMENTS

Ligation of all thyroid arteries in completely or almost completely depancreatized dogs leads to the disappearance of sugar from the urine in from one to five days after ligation, provided tetany or infection does not occur. Parallel with the disappearance of the sugar, the blood sugar greatly diminishes or may become normal.

Partial ligation of the thyroid arteries does not lead to cessation of glycosuria, and the blood sugar may even become increased.

Total thyroidectomy which is preceded by partial ligation of the arteries leads to the disappearance of sugar, provided tetany does not occur. If, however, mild attacks of tetany set in, the glycosuria does not cease. But when one succeeds in checking the tetanic seizures completely, by intravenous injections of calcium lactate, the sugar in the urine disappears entirely, and reappears when tetany sets in again. Parallel with the disappearance of sugar in the urine, the blood sugar greatly diminishes and becomes normal.

If a small amount of pancreatic tissue is removed in order to cause hyperglycemia, one-sided thyroidectomy does not diminish the blood sugar content; and if, in removing the second lobe, a tiny fragment of thyroid is left, the blood sugar may become normal temporarily, but later it becomes high. These dogs with high blood sugar gain in weight and remind one of human beings in the prediabetic state.

If one succeeds in causing diabetes in a dog by removing a comparatively small amount of pancreatic tissue, 1 gm. per kilogram of body weight, and succeeds also in sparing all the parathyroids of the animal in performing a thyroidectomy, the glycosuria which has not ceased after partial ligation of the arteries ceases after removal of the thyroid.

ABSTRACTS FROM PROTOCOLS OF SOME EXPERIMENTS PERFORMED IN 1921

LIGATION OF ALL THYROID ARTERIES IN DEPANCREATIZED DOGS

EXPERIMENT 1 (Dog 4).—Complete pancreatectomy was performed, March 2. The urine was positive for sugar from the day following operation in amounts varying from 5 to 6 per cent. Ligation was effected, March 5. The dog continued to have sugar in the urine until March 8. The urine became sugar free, March 9, and continued to be sugar free in passed and catheterized specimens until March 19, when the dog developed distemper, which was followed by death on the next day. Necropsy revealed lobular pneumonia involving all lobes and complete absence of pancreatic tissue.

EXPERIMENT 2 (Dog 15).—Complete pancreatectomy was performed, June 22. There was glycosuria from June 23 to June 28. Ligation was effected, June 28. The urine was sugar positive, June 29, and sugar negative on daily examinations of passed and catheterized specimens from June 30 to July 13. The animal was found dead, July 14. Necropsy revealed no demonstrable lesions. The dog had a good appetite until July 12.

EXPERIMENT 3 (Dog 10).—Complete pancreatectomy was performed, June 29. There was glycosuria from June 30 to July 5. Ligation was effected, July 5. The urine was strongly positive for sugar, July 6, but there was no a trace of sugar in the urine, July 7. There was glycosuria from July 8 to July 14. Twitching of the musculature of the back took place from July 8 to July 10. July 11, the dog had a severe attack of tetany. July 12, he had mild attacks of tetany. Infection at the neck was noted. The dog was killed with chloroform, July 14. Necropsy revealed a large pocket of pus at the neck.

EXPERIMENT 4 (Dog 16).—Almost complete pancreatectomy was performed, July 25. There was glycosuria from July 27 to July 30. Ligation was effected, July 30. Glycosuria persisted until August 6, when the animal was found dead. There was no necropsy. During the course of the experiment, no tetany was noted. Infection at the neck was noted, August 3, four days after ligation.

EXPERIMENT 5 (Dog 9).—Almost complete pancreatectomy was performed, April 3. There was glycosuria from April 4 to April 10. The superior and inferior thyroid arteries on the right side were ligated. Glycosuria persisted on daily examinations. The superior and inferior thyroid arteries on the left side were ligated, April 17. The urine was sugar positive, April 18. The dog died on the next day from a severe attack of tetany. The animal was in good condition until the day after the second ligation. No necropsy was performed.

COMPLETE THYROIDECTOMY PRECEDED BY LIGATION OF INFERIOR THYROID ARTERIES IN DEPANCREATIZED DOGS

In these experiments, two or three parathyroids were left in situ, and all were left in one dog.

EXPERIMENT 6 (Dog 17).—Partial pancreatectomy was performed, November 9. Glycosuria was noted from the 10th to the 16th. Ligation was effected, November 16. Glycosuria persisted from the 17th to the 30th. Thyroidectomy was performed, December 1. There was not a trace of sugar in the urine, December 2. Glycosuria followed, and the dog developed a severe attack of tetany early in the morning and died in the afternoon. Necropsy did not reveal demonstrable lesions.

EXPERIMENT 7 (Dog 14).—Partial pancreatectomy was performed, December 3. There was glycosuria from the 5th to the 7th. Ligation was effected, December 7. Glycosuria persisted until the 10th. Thyroidectomy was performed, preceded by intravenous injections of 10 c.c. of 5 per cent. calcium lactate solution. Three parathyroids were left in situ. There was glycosuria, December 12 and 13. Twitching of the musculature of the back was noted. Fifty cubic centimeters of 5 per cent. solution of calcium lactate was administered through a stomach tube. December 14, the dog had a severe attack of tetany early in the morning. At 11 a. m. calcium lactate was injected intravenously in the same dosage as preceded the operation. The animal recovered from the attack, but twitchings persisted. At 2 p. m., he had another attack and was in a dying condition. At 3 p. m., calcium lactate in the same dosage was injected. The dog was catheterized twice, and on both occasions a positive test for sugar in the urine was obtained by adding two drops to Benedict's solution. December 15 and 16, the animal completely recovered from the attack, had an excellent appetite and ate plenty of bread and meat. There was not a trace of sugar in the catheterized and passed specimens of urine, according to tests made with Nylander's and Benedict's reagents. On the 17th, 18th and 19th, twitchings were seen but there were no severe attacks; sugar in the urine was strongly positive. On the 20th, the dog had a severe attack

of tetany. Sugar in the urine was strongly positive. Calcium lacate was injected intravenously in the morning and in the afternoon. December 21 and 22, tetany was completely absent. The urine was sugar free on these days. December 23, the dog was bitten in the back by another dog. On account of the large open wound, he was killed.

EXPERIMENT 8 (Dog 19).—Partial pancreatectomy and ligation of inferior thyroid arteries was performed, December 17. Glycosuria was noted from the 18th to the 21st. Thyroidectomy was performed, December 21. Glycosuria was noted from the 23d to the 25th, and twitching of the musculature of the back was noted on the day following removal of the thyroid. This persisted, although daily subcutaneous injections of calcium lactate, in the same dosage as the intravenous injections, were given. The animal vomited with blood, December 24 and 25, and was found dead, December 26. Necropsy revealed no pneumonia, but the stomach was filled with blood. No food was present. The mucosa of the pylorus was covered with numerous hemorrhagic erosions.

EXPERIMENT 9 (Dog 28).—On a male dog, weighing 14 kg., partial pancreatectomy was performed, January 12. He became glycosuric on the day following the removal of about 1 gm. of pancreatic tissue per kilogram of his body weight. Seven days after there was from 2 to 3 per cent. of sugar in the urine. Both inferior thyroid arteries were ligated. The glycosuria persisted on daily examinations. Seven days later, both lobes of the thyroid were removed; all the parathyroids were spared. There was not a trace of sugar in the urine on the day following thyroidectomy, and the urine remained sugar free for 108 days, although eleven days after removal of the thyroid, additional pancreatic tissue was removed, and ninety-three days after the second pancreatectomy, the last remnant of the gland was taken out. The animal was sugar free for four days after the third pancreatectomy. He died on the fifth day from prolapse of the intestine, which was probably brought about by the three laparotomies. The dog's condition was excellent throughout; he ate well until the day of the accident. He did not show signs of myxedema during the time of observation, and while his original weight was 14 kg., his weight on the day before death was 15.9 kg., a gain of 1.9 kg. The blood sugar remained normal, and fourteen days after removal of the thyroid, the sugar tolerance was about 10 gm. per kilogram of the body weight.

ABSTRACTS FROM PROTOCOLS OF EXPERIMENTS PERFORMED IN 1922

Thyroidectomy was performed in one or two sittings in depancreatized hyperglycemic dogs which at no time showed glycosuria. Three parathyroids were spared in all of them.

EXPERIMENT 10 (Dog 20).—Partial pancreatectomy was performed, February 2. Hyperglycemia was noted, and a secopd pancreatectomy was performed, February 20. Hyperglycemia increased. Right-sided lobectomy was performed, February 27. Hyperglycemia persisted. Left-sided lobectomy was performed, March 13. The animal died, March 17, from an acute attack of tetany.

EXPERIMENT 11 (Dog 27).—Partial pancreatectomy was performed, April 9, followed by hyperglycemia. Right-sided lobectomy was performed, April 22. Hyperglycemia increased, and left-sided lobectomy was performed, April 29. In the morning of May 1, the animal had a severe attack of tetany. The dog recovered after subcutaneous injection of calcium lactate, but died in the afternoon from tetany.

EXPERIMENT 12 (Dog 23).—Partial pancreatectomy was performed, March 8, followed by hyperglycemia. After removal of both thyroid lobes, March 19, blood sugar was normal, March 20. Tetany manifested itself March 21, and was checked by intravenous injections of calcium lactate. The animal was free from tetany from March 21 in the afternoon until March 25, when it suddenly developed tetany and was killed with chloroform. The blood sugar was normal on the afternoon of March 21 and on two examinations, March 22.

EXPERIMENTS ON DEPANCREATIZED HYPERGLYCEMIC DOGS

In these animals, when the second lobectomy was performed, a tiny fragment of thyroid tissue was left; also three parathyroids were spared.

EXPERIMENT 13 (Dog 24).—Partial pancreatectomy was performed, March 15, followed by hyperglycemia. There was hyperglycemia after right-sided lobectomy, March 25. After left-sided incomplete lobectomy, April 1, there was a tendency of the blood sugar to become normal, but it ultimately remained high. There was considerable gain in weight, which was originally 9 kg., March 25; ten days after pancreatectomy, it was 8 kg.; May 8, it was 11.6 kg.

EXPERIMENT 14 (Dog 25).—The pancreatic tail was removed, April 2. There was hyperglycemia. Right-sided lobectomy was performed, April 15. There was hyperglycemia. An incomplete left-sided lobectomy was performed, April 23. At the beginning, the blood sugar became normal, but later it increased and remained high. There was a gain in weight, which was originally, 7 kg., and May 8, 7.6 kg.

EXPERIMENT 15 (Dog 26).—Partial pancreatectomy was performed, April 8. There was hyperglycemia. Right-sided lobectomy was performed, April 17. There was hyperglycemia. An incomplete left-sided lobectomy was performed, April 24. There was normal blood sugar at the beginning, but later it became high. The original weight was 10.8 kg.; April 24, the dog weighed 10.1 kg.; the weight, May 8, was 11.2 kg.

These three animals are alive and in excellent condition.

COMMENT

The glycosuria and hyperglycemia in diabetic dogs, after complete ligation of the thyroid vessels, or after complete thyroidectomy, provided tetany or infection does not occur, must be ascribed to the absence of thyroid hormones from the blood stream. When a condition of athyroidism established itself in the dog in Experiment 9, even repeated pancreatectomies did not cause the reappearance of glycosuria. The considerable gain in weight in this animal must also be credited to the condition of athyroidism created by the complete removal of the thyroid. The sugar tolerance in this animal remained high as in thyroidectomized dogs without diabetes. The dogs in Experiments 13, 14 and 15, in which a minute fragment of thyroid tissue was left at a second lobectomy, differed from the dog in Experiment 9 in that the glycemia remained high. The tendency to obesity, however, manifested itself in these animals, as in the dog in Experiment 9, which had been deprived of all its thyroid tissue.

Since the incompletely depancreatized dogs are still alive, one can only speculate as to the histologic picture in their remnants. But it is highly probable that a compensatory hypertrophy occurred in the fragment left behind. Ribbert [25] was the first to point out that, in incompletely thyroidectomized dogs, hyperplasia occurs in the remnant, and this hyperplasia is usually noticeable in the peripheral acini. MacCallum [26] writes that the so-called typical hyperplastic type of exophthalmic goiter may be noted in dogs in the small fragment left after incomplete thyroidectomy. It is well known that in man hypothyroidism may go hand in hand with hyperthyroidism. A similar condition might have occurred as a result of incomplete removal of the thyroid in the dogs in Experiments 13, 14 and 15. On account of deprivation of the greater parts of their thyroids, a tendency to obesity was established.

For the persistence of hyperglycemia, of course, a compensatory hypertrophy might have been responsible.

25. Ribbert: Ueber die Regeneration des Schilddrüsengewebes, Virchows Arch. f. path. Anat. **117**: 151, 1889.

26. MacCallum, W. G.: A Text Book of Pathology, Philadelphia, W. B. Saunders Company, 1916, p. 817.

This would be quite in accord with clinical facts that the dextrose tolerance is low in hyperthyroidism and that there may be in man a combination of subthyroidism and glycosuria. It should be emphasized that the condition created in the three animals by partial pancreatectomy and incomplete thyroidectomy greatly resembles the preglycosuric or prediabetic state in man, i. e., increase in body weight and hyperglycemia.

TABLE 1.—BLOOD SUGAR IN NORMAL DOGS

No.	Mg. Sugar per Hundred C.c. Blood	No.	Mg. Sugar per Hundred C.c. Blood
1	53	8	90
2	83	9	78
3	56	10	98
4	76	11	104
5	78	12	104
6	67	13	104
7	94	14	100

The persistence of glycosuria after thyroidectomy, or after complete ligation of the thyroid arteries, when tetany develops, indicates the antagonism between the parathyroids and the thyroid. The high dextrose tolerance in nondiabetic thyroidectomized dogs in which the parathyroids were preserved has already been referred to.

TENTATIVE CONCLUSIONS

The question arises whether our experimental results can be applied to the treatment of human diabetes. Our material is not sufficiently large to permit definite conclusions. But the following line of reasoning leads one to believe that complete thyroidectomy in diabetics must be at least as effective. The advantages to man might be as follows:

1. The loss of the pancreatic islet, produced by complete or almost complete pancreatectomy, rarely has its counterpart in human diabetes.

TABLE 2.—BLOOD SUGAR IN DOGS AFTER PANCREATECTOMY

No.	Sex*	Body Weight, Kg.	Weight of Removed Pancreas per Kilogram of Body Weight, Gm.	Weight of Removed Gland per Kilogram of Body Weight, Gm.	Sugar per Hundred C.c. Blood, Mg.	No. Days Following Operations When Sugar Determinations Were Taken
2	♀	10.0	23.0	2.30	263	3
3	♂	8.3	22.5	2.71	270	3
4	♂	7.5	18.2	2.42	250	3
5	♂	9.1	20.0	2.20	125	9
6	♀	8.7	21.0	2.42	256	6
7	♀	13.0	28.0	2.15	222	7
9	♂	6.7	17.0	2.53	300	7
15	♂	9.6	21.0	2.10	238	6
10	♀	20.0	44.0	2.20	238	6
13	♂	8.6	15.0	1.85	100	4
16	♀	13.8	20.0	1.45	228	5
17	♂	13.0	17.0	1.30	250	7
18	♂	17.8	35.0	1.96	300	7
14	♀	15.7	26.0	1.60	290	4
19	♀	12.0	23.0	1.90	258	4

* In this column, ♂ indicates male; ♀ indicates female.

2. The external apparatus in diabetes usually remains intact, so that even great losses in body weight resulting from this malady may be counteracted by thyroidectomy.

3. There is hardly a chance for a skilful surgeon to damage the parathyroids in man on account of the difference in the topographic relation of the latter to the thyroid.

4. Shock from the operation may be avoided by performance of the operation in two sittings.

One may hesitate in proposing complete thyroidectomy for the treatment of diabetes, since it has never been recommended, but one of Rohdenburg's [27] cases offers direct support for such a suggestion. The patient developed exophthalmic goiter during a course of diabetes mellitus. A part of the thyroid was removed. The glycosuria ceased and the patient remained sugar free for several years. In a second case of Rohdenburg, partial thyroidectomy was performed by Dr. Semken for exophthalmic goiter. Several years later glycosuria developed. Dr. Semken removed more of the thyroid, leaving only the isthmus. A complete cure occurred also in this patient.

It is perhaps worth mentioning that total removal of the spleen brings about a cure in hemolytic jaundice, the etiology of which is just as unknown as in diabetes mellitus. Although the majority of physicians believe that the chief trouble in the former condition lies in the spleen, others, for example, Pick and Strauss,[28] adhere to the hepatic origin of this malady. It is possible that a cure is accomplished in hemolytic jaundice

TABLE 3.—BLOOD SUGAR IN NORMAL DOGS AFTER PARTIAL PANCREATECTOMY

No.	Sex	Body Weight, Kg.	Weight of Removed Pancreas per Kilogram of Body Weight, Gm.	Weight of Removed Gland per Kilogram of Body Weight, Gm.	Sugar per Hundred C.c. Blood, Mg.	No. Days Following Operations When Blood Sugar Determinations Were Taken
12	♂	11.2	27	2.70	127	5
14	♂	13.7	14	1.02	91	11
20	♂	22.0	13	0.60	108	5
					84	11
					133	18
		19.0	28.5	1.24	196	5
21	♂	17.7	18	1.02	79	5
		(second pancreatectomy)				
22	♂	27.2	22	0.80	143	11
23	♂	12.2	20.2	1.65	148	11
24	♂	9.0	14	1.55	158	10
25	♂	7.0	4.3	0.61	111	13
26	♂	10.8	11.9	1.10	143	9
27	♀	11.0	22.8	2.05	143	13

because of removal of the gland which plays a secondary rôle in the disease. It is probable, then, that diabetes mellitus may be cured by removal of the gland which plays a secondary rôle in this malady. If the view that we take is correct, then complete thyroidectomy in two stages should be beneficial in diabetes mellitus of young children, in whom the mortality is about 100 per cent. The procedure may also be tried in diabetic adults who do not respond to any of the modern methods of treatment.

INTERPRETATION OF TABLES

Table 1: These dogs were starved from eighteen to twenty-four hours before blood was taken for estimation of glucose. The highest figures were obtained during the hot days of July.

Table 2: Nine males and six females whose body weights ranged from 6.7 to 20 kg., became persistently glycosuric after pancreatectomy. One dog became glycosuric after the removal of 1.3 gm. per kilogram of body weight. Dog 28, not included in this table, persistently showed glycosuria after removal of 1 gm. per kilogram of body weight. Dog 13, which was glycosuric, did not show an increase in the blood sugar content. The higher blood sugar figures in fourteen

27. Rohdenburg, G. L.: Thyroid Diabetes, Endocrinology 4:163 (Jan.-March) 1920.

28. Pick, E., and Strauss, H., quoted by Hans Hirschfeld: Erkrankungen der Milz, Berlin, Julius Springer, 1920, p. 232.

glycosuric dogs ranged between 290 and 125 mg. per hundred cubic centimeters of blood.

Table 3: Nine males and one female did not become glycosuric after partial pancreatectomy. The body weight ranged between 7 and 27.2 kg. Eight of ten became hyperglycemic. In one dog (Dog 20), vicarious hyperfunction of the pancreatic islets established itself eleven days after removal of the pancreatic tail, but the normal glycemia did not last. There was a greater increase in the glucose of the blood five days after the second pancreatectomy. Dog 12 did not become glycosuric, although 2.7 gm. of the pancreas per kilogram of body weight was removed.

Table 4: In these glycosuric dogs, the sugar from the urine disappeared after complete ligation of the thyroid vessels and after complete thyroidectomy, which was preceded by partial ligation when tetany did not occur. Partial ligation alone did not check the glycosuria. In Dog 28, the glycemia remained normal for two months, and the sugar tolerance was normal after thyroidectomy. The blood sugar also became normal in Dog 4 and, in Dog 18 it became normal when tetany was checked by calcium lactate injections. Partial ligation of the vessels did not have any influence on the glycemia.

Table 5: The blood sugar became normal in one of the hyperglycemic dogs (Dog 23) after complete thyroidectomy, and when tetany was kept in check by calcium lactate injections. The blood sugar in none of the dogs became normal after right-sided lobectomy. Dogs 24, 25 and 26 remained hyperglycemic after incomplete removal of the left lobe, although at first there was a drop of the blood sugar to normal. These dogs showed a tendency to obesity.

TABLE 4.—BLOOD SUGAR IN GLYCOSURIC DOGS

	Mg. Sugar per Hundred C.c. of Blood				
	After Total Ligation	After Partial Ligation	After Thyroidectomy	Dates	Comment
4	192	...	...	Mar. 7	Animal remained sugar
	90	...	...	Mar. 10	free ten days after
	50	...	...	Mar. 14	ligation
6	180	...	...	Mar. 25	Blood sugar diminished
	240	...	...	Mar. 30	after ligation; increased with tetany
9	...	244	...	April 17	Glycemia increased after partial ligation
15	300	...	...	July 1	Remained sugar free for
	172	...	...	July 5	fourteen days
10	243	...	...	July 14	Sugar free one day after ligation; reappearance of glycosuria with tetany
28	...	...	95	Feb. 15	Persistent glycosuria
			86	Mar. 9	after partial ligation;
			66	April 15	sugar free 108 days after thyroidectomy
17	...	285	...	Nov. 30	Increased blood sugar
			145	Dec. 2	after partial ligation; sugar free on days when tetany free
18	...	240	...	Dec. 10	Increased blood sugar
			228	Dec. 17	after partial ligation;
			100	Dec. 22	sugar free on days when tetany was absent

SUMMARY

1. Diabetes mellitus is primarily a disease of the insular apparatus of the pancreas, with an actual pathologic condition in severe cases.

2. The low sugar tolerance in all cases of hyperthyroidism suggests that the islands of Langerhans in this disease are always functionally affected, and that, occasionally, histologic changes in them may occur in those rare cases in which exophthalmic goiter and diabetes mellitus are combined.

3. Since overactivity of the thyroid caused by pathologic alteration in the gland upsets the pancreatic islets, a pathologic condition of the latter may functionally affect the thyroid.

4. The fact that true myxedematous individuals are not liable to become diabetic, and that a spontaneous cure from diabetes mellitus may occur through hypoplasia of the thyroid, brought about by various unknown causes, is highly suggestive that complete removal of the thyroid in man might have a curative effect for the malady.

TABLE 5.—BLOOD SUGAR IN HYPERGLYCEMIC DOGS

	Mg. Sugar per Hundred C.c. of Blood				
No.	After One-sided Lobectomy	After Incomplete Removal of Second Lobe	After Complete Removal of Both Lobes	Dates	Comment
20	167	...	...	Mar. 4	Animal died from tetany
	181	...	...	Mar. 13	four days after removal of second lobe
23	...	...	102	Mar. 20	Blood sugar, in absence
			109	Mar. 21	of tetany, normal;
			98	Mar. 22	tetany prevented three days by calcium lactate injections
24	139	...	...	Mar. 28	Blood sugar became nor-
	152	...	...	April 1	mal on April 12, but
		143	...	April 2	the glycemia remained
		185	...	April 4	high; great gain in
		100	...	April 12	weight
		137	...	April 24	
		123	...	May 2	
25	111	...	...	April 23	Drop in blood sugar to
		100	...	April 26	normal three days
		139	...	May 3	after lobectomy; glycemia remained high; gain in weight
26	135	...	...	April 24	Glycemia decreased at
		109	...	April 27	first, but become high;
		124	...	May 3	gain in weight
27	160	...	...	April 29	Blood sugar increased after removal of right lobe; animal died from tetany after removal of left lobe

5. That the removal must be a complete one becomes evident from clinical observations that subthyroidism and diabetes are found combined in the same individual.

6. The association of hyperglycemia with a tendency to obesity, in depancreatized nonglycosuric dogs after incomplete pancreatectomy, resembles the prediabetic state in man, i. e., hyperglycemia and increase in body weight.

7. Depancreatized glycosuric dogs become sugar free after complete ligation of the thyroid arteries or after thyroidectomy, preceded by partial ligation of the vessels, provided tetany or infection does not occur.

8. Partial ligation of the thyroid vessels or one-sided lobectomy has no effect in checking the glycosuria or the hyperglycemia.

9. From some considerations given in this discussion, it is probable that thyroidectomy in two sittings may be even more effective in human diabetes than in depancreatized dogs.

10. It is therefore suggested that complete thyroidectomy should be tried in the diabetes of children and in severe diabetes of adults who do not respond to the modern treatment.

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ABSTRACT OF DISCUSSION

DR. WALTER M. BOOTHBY, Rochester, Minn.: An increase in carbohydrate tolerance is obtained by reducing the basal metabolism in patients with severe diabetes. This may be accomplished readily, as pointed out by Wilder, Boothby and

Beeler, by an appropriate reduction in the total calories ingested and by keeping the protein intake low. A reduction in the basal metabolism can also be obtained by removal of the thyroid gland, but with many secondary disadvantages. The reduction in the basal metabolism and also the total metabolism probably explains the results obtained by Friedman and Gottesman. However, to infer that thyroidectomy is a desirable method of decreasing the basal metabolism, and thereby possibly increasing the sugar tolerance in diabetes is, I think, not the intent of the paper.

DR. CHARLES W. GREENE, Columbia, Mo.: It seems rather apropos of this paper, since Dr. Boothby did not mention this fact, to state that, in the first week of this month in Washington, Dr. J. J. R. Macleod reported an investigation in his laboratory in which they are isolating and testing the internal secretion of the pancreas. In diabetes experimentally produced they are able actually to get a deposit of glycogen in the liver if the amount of sugar in the blood is augmented by injection at the time of injecting the internal secretion of the pancreas. That fact has never been demonstrated before. It would seem that the Toronto laboratory is producing an extract of pancreas in which an internal secretion is prepared in sufficiently pure form for experimental purposes. At the time of the announcement, the encouraging promise was extended of a preparation pure enough for therapeutic purposes, applicable to the rather hopeless cases of pancreatic diabetes.

DR. ARNO B. LUCKHARDT, Chicago: If I understood Dr. Boothby correctly, he inferred that animals which had suffered partial or complete thyroidectomy were extremely sluggish. Dr. Dragstedt and I have animals alive months after complete thyroparathyroidectomy. These animals are extremely active. No amount of thyroid feeding has changed them in the slightest degree. The question of the importance of the thyroid to the dog is interesting; one cannot produce symptoms of myxedema in the dog. You can remove both lobes and all four parathyroids without changing the animal in the least degree.

DR. A. J. CARLSON, Chicago: It is difficult to predict what will happen to the blood sugar in a dog on which a partial pancreatectomy has been performed. Even though we try to remove enough of the organ to produce the Sandmeyer type of diabetes, we cannot predict whether the dog will be partially diabetic for one, two or three weeks and then spontaneously recover and be perfectly normal so far as sugar tolerance is concerned, or whether he will gradually go down. The authors use the term pancreatectomy a little too loosely. While they give a number of experiments, I am not sure that the hyperglycemia they described has anything to do with the operation of the thyroid. I do not deny, of course, the fact that occasionally glycosuria and real diabetes are associated with toxic goiter, but, by the law of chance, we are going to have these together in one person, particularly in races having a higher percentage of toxic goiter as well as of diabetes. If the pancreatic diabetes is causally connected with thyroid hyperactivity or hypoactivity, that fact would have been brought out by the clinical condition more clearly than it is at present. I should like to emphasize the point that Dr. Luckhardt has brought out, that the story of thyroid function is by no means clear in all animals. Years ago, I fed from 10 to 20 gm. a day of desiccated (therapeutic) thyroid to dogs, without loss of body weight. We did not follow the basal metabolic rate, but one of the workers in our laboratory is following that at present and so far as this work goes, feeding dried thyroid to dogs, in ten times the therapeutic dose given to man, has not influenced the basal metabolic rate.

DR. G. A. FRIEDMAN, New York: I think it would be worth while to study the basal metabolism in depancreatized and thyroidectomized dogs. It is rather difficult to answer the question as to what the metabolic rate would be in such animals. However, the actual metabolic changes in them, from a practical standpoint, are unimportant. Our aim was to show the disappearance of glycosuria in depancreatized dogs after complete thyroidectomy or complete ligation of the thyroid vessels, when tetany did not occur. It was possible to free a dog from glycosuria after thyroidectomy. The animal gained considerably in weight and was lively, being on a liberal diet throughout. It is our impression that depancreatized and thyroidectomized dogs do not show signs of myxedema as compared with the stuporous condition of thyroidectomized nondiabetic dogs, which was noted by one of us in experiments performed some years ago. The thyroidectomized normal animals are not so liable to develop tetany as diabetic dogs. Pancreatic extracts, but not the actual insular products, were administered intravenously to diabetic dogs by Meltzer and Kleiner. They showed that glycosuria was checked as long as injections were given. It is possible that the recently discovered endocrine product from the pancreas will have a transitory effect in diabetics similar to that of epinephrin in Addison's disease. One may succeed in raising blood pressure through injections of the drug for a short time, but one cannot obtain permanent results. In regard to Dr. Carlson's remark, our paper was practically an abstract and he will find more convincing evidence in the original. There is some evidence in the literature that the histologic picture in depancreatized dogs corresponds to the picture in overactivity. Our own histologic studies of the thyroids in depancreatized dogs we reserved for another paper. I believe it is of equal importance to investigate the iodin content of the thyroids in diabetic dogs. Such work is already in progress.

DIFFERENTIAL DIAGNOSIS OF DIABETES BY MEANS OF GLUCOSE TOLERANCE *

HENRY J. JOHN, M.D.
CLEVELAND

Given a case with sugar in the urine, is one justified in concluding that "This is a case of diabetes"? In my judgment it may or it may not be; and, on the other hand, a case without sugar in the urine may be a case of diabetes, as can be clearly demonstrated by blood sugar determination. A fasting hyperglycemia means diabetes; and sugar in the urine alone means simply that the renal filter is permeable to sugar—nothing more. This permeability of the renal filter varies with the individual, and may be present at any concentration of sugar in the blood from 45 to 348 mg. per hundred cubic centimeters. The renal filter of every person is permeable at some point between these extremes. It is incorrect to consider the permeability at 170 mg. per hundred cubic centimeters as normal, and therefore the term "individual permeability" should be substituted for "normal permeability," the "individual permeability" in any case being the normal permeability for the person in question. The individual permeability probably varies with age and with disease, just as blood pressure does, a point which has never been investigated. We do know, however, that the individual permeability is increased in cases of untreated diabetes (Macleod). A person with a renal permeability when his blood sugar content is 45 mg. per hundred cubic centimeters is in apparently as good health as the one with a renal permeability at 200 mg. Both are apparently well, for no pathologic condition can be demonstrated, clinically. Thus we must assume that each of these extremes is normal for the individual in question.

To illustrate the value of glucose tolerance estimations as a means of differential diagnosis, and the inaccuracy of urine examination alone, I am offering the reports of six cases with the blood sugar chart of each.

* From the Cleveland Clinic.

It may be well to state that I consider that glucose tolerance studies are definitely indicated in the presence of:

1. Glycosuria.
2. Sudden obesity.
3. Diabetes, chiefly to determine the severity of the condition and the renal permeability.
4. Hyperglycemia, as revealed by the routine blood sugar estimation.
5. The presence of fasting blood sugar to the amount of from 125 to 135 mg. per hundred cubic centimeters, and of blood sugar three hours or more after the last meal to an amount above 120 mg. per hundred cubic centimeters.
6. The familial occurrence of diabetes, to separate children who have the diabetic tendency from those who are perfectly normal.

PROCEDURE

The first blood specimen in each case is taken in the morning before any food has been taken, after which glucose is given as described below and no other food is taken during the intervals between the successive blood tests. During the period of four or more hours required for the complete study, each patient remains in a private room where he is at liberty to sit up and read or to lie down as he chooses.

Whenever possible, the patient is advised not to urinate in the morning until his arrival at the clinic, in order that the urine may be secured just before the test. In any case the bladder is emptied before the first test is made. This accounts for the large amount of urine in the first specimen in some of the cases. This amount, however, is not included in the calculation of the total output of urine during the period covered by the study, as this always starts with an empty bladder. This initial specimen is used only as a control, to see whether or not the patient "starts" with a glycosuria.

The first specimen of blood amounts to about 12 to 19 c.c. in order to have a sufficient amount for the determination of chlorids, urea, uric acid, creatinin, and for the Wassermann reaction, etc., in addition to the blood sugar estimation. From 6 to 8 c.c. is taken for each of the subsequent tests.

Following the taking of the first specimen, the patient is given 100 gm. of anhydrous glucose dissolved in from 250 to 350 c.c. of water to which the juice of one or two lemons has been added. This solution is less nauseating if it is ice cold. The time is noted, and specimens of blood are taken at the end of one-half hour, one hour, and two, three and four hours. At the end of each hour the patient voids, each time in a separate jar, and is given 200 c.c. of cold water to drink. The last water taken is not included in the total water intake, however, as no later specimen of blood is taken.

On each sample of blood four observations are made: (1) sugar content of whole blood; (2) sugar content of plasma; (3) sugar content of corpuscles, and (4) corpuscle volume.

On each specimen of urine these observations are made: (1) total volume; (2) specific gravity; (3) presence or absence of sugar, qualitatively determined by the Benedict reagent, and (4) sugar content, quantitatively estimated by the Benedict method.

The blood sugar estimation is made by Myer's modification of Benedict's method, the Kober colorimeter being used. The estimation of the corpuscle volume is made by centrifuging the oxalated blood at the rate of 3,000 revolutions a minute for ten minutes.

EXPLANATION OF CHARTS

The checkered columns at the top of the charts indicate the water intake; the solid black columns at the top indicate the urine output. The total intake and output during the period of four hours or more is indicated by a like marking at the lower right corner of the chart. The circles at the lower ends of the black columns indicate the presence of sugar in the urine.

The broken horizontal line opposite 120 is the normal level of blood sugar, i. e., 120 mg. per hundred cubic centimeters of blood. The broken vertical line opposite 3 hours indicates the period within which, in normal persons, the blood sugar content again becomes normal after the ingestion of the standard dose of glucose. The heavy curve represents the blood sugar content at the designated periods. The dots which break the glucose tolerance curve indicate the intervals at which blood was taken for sugar estimation. Each solid black column at the bottom of the charts represents the sugar content of the urine output indicated by the corresponding solid black column at the top of the chart. Each square included in these lower columns represents 1 gm. of sugar, and the total sugar output—the sum of these squares—is indicated by the solid black portion of the large square at the right of the chart, which includes 100 squares, representing 100 gm. of glucose—the total sugar intake.

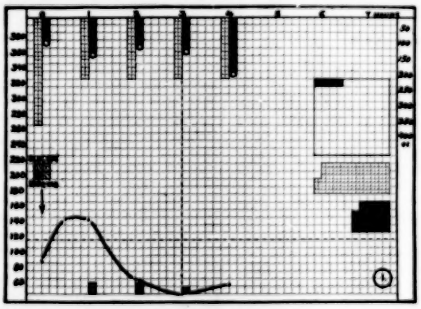

Chart 1.—Blood sugar in Case 1.

REPORT OF CASES

CASE 1.—*History.*—A man, aged 32, an upholsterer, married, whose wife was living and well and had one child in good health, and whose past history was negative, several years ago had an appendectomy, and the glands in the groin were incised and drained. He was referred by his factory physician, who had discovered sugar in the urine, following which he turned him over to his family physician, who gave him some medicine which was imported from Germany. He prescribed gluten bread and plenty of water, and told the patient to eat but little meat, no vegetables, no sugar and no flour. It is self-evident that no sensible human being will confine himself to such a dietary regimen, nor did this patient. During subsequent investigation the factory physician found that the patient was not improving, and sent him to the clinic. The man showed a fasting blood sugar content of 92 mg. per hundred cubic centimeters—a perfectly normal amount. Sugar was present in the urine, however, throughout the test. The highest rise of blood sugar appeared at the end of half an hour; in one and one-half hours the blood sugar content, as shown by the curve, was normal. The blood sugar curve was that of a perfectly normal person, like my own, for example, as shown in Curve 2, Chart 7.

The patient received 950 c.c. of water by mouth during the four hours of the test, and put out 470 c.c. of urine. The ingestion of glucose was 100 gm. Of this he excreted 3.84

gm. in the urine, as follows: first hour, 1.485 gm.; second hour, 1.445 gm.; third hour, 0.91 gm.; fourth hour, only a trace. It appears, then, that this man's kidneys were moderately permeable for sugar, the permeability of his renal filter being below 120 mg. per hundred cubic centimeters. The coincident blood examinations showed plasma chlorids, 605 mg. per hundred cubic centimeters; blood urea, 21 mg.;

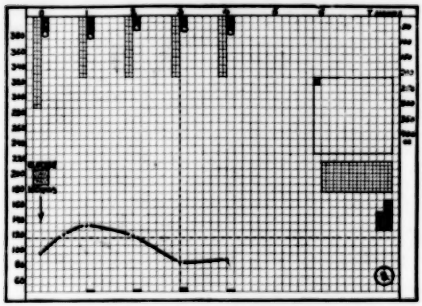

Chart 2.—Blood sugar in Case 2.

blood creatinin, 1.5 mg., and blood uric acid, 2 mg. per cubic centimeters. The Wassermann reaction was negative.

Comment.—In this case a young man, in good health, with a good carbohydrate tolerance, but with kidneys which were permeable to less than the normal blood sugar content, was subjected to an unnecessary and dangerously depleting dietary. In this type of individual, the presence of sugar in the urine does not mean anything and there is no reason to expect that this person will develop diabetes unless a pancreatitis develops from an intercurrent infection or from some other cause. Glycosuria in this man is not diabetes.

CASE 2.—*History.*—A physician, aged 44, married, with two children in good health, whose father died of diabetes, when 9 years of age had measles which was followed by a protracted cough. He came to the clinic with a diabetophobia, being quite certain that he had diabetes since he showed sugar in the urine, for which he had been treating himself for several years without avail. The patient was a slender, thin man with negative physical findings outside of fibrosis of both apexes. No tubercle bacilli were found. His highest weight had been 130 pounds; the present weight, 112 pounds. His fasting blood sugar was 100 mg. per cubic centimeters. After the ingestion of 100 gm. of glucose, the highest rise of blood sugar came at the end of one hour, at which time it was 136 mg. per hundred cubic centimeters. The normal content was again reached in little more than two hours. Sugar was present in the urine throughout the period of the test. Thus, although his blood sugar was below normal, this patient still showed glycosuria. The total intake of water during this period was 900 c.c.; total urine output, 162 c.c.; total sugar intake, 100 gm.; total sugar output, 0.775 gm., excreted as follows: first hour, 0.13 gm.; second hour, 0.13 gm.; third hour, 0.37 gm.; fourth hour, 0.14 gm. The plasma chlorids were 575 mg. per hundred cubic centimeters; blood urea, 35 mg. per hundred cubic centimeters; Wassermann reaction, negative.

Comment.—This patient, a middle aged man, a physician, scared to death of diabetes, had been subjecting himself to a low diet because he had glycosuria. This glycosuria was due to the permeability of his renal filter and not to hyperglycemia. Thus, he was not a diabetic, since he had a good carbohydrate tolerance.

CASE 3.—*History.*—A woman, aged 30, married, with two children living and well, had passed the menopause two years before. Her family history was negative. She had otitis media five years before; she had had none of the diseases of childhood. Her complaint was that she had had diabetes for the last three years, which had been ushered in with the usual symptoms—marked thirst, polyuria and polyphagia. Her physician treated her with some medicine imported from Germany. She did not adhere to any diet, resting her hope on the German medicine. The physical examination disclosed a slight cataract, a slight enlargement of the thyroid, and no teeth; otherwise it was negative. The blood pressure was 170 systolic and 100 diastolic. There was a slight sclerosis of the palpable arteries. Repeated Wassermann tests were negative. The blood examination revealed: plasma acetone, negative; urea, 30 mg. per hundred cubic centimeters; nonprotein nitrogen, 26 mg.; plasma chlorids, 635 mg.; phenolsulphonephthalein functional test, 50 per cent. excretion in the first hour. The fasting blood sugar was 234 mg. per hundred cubic centimeters. After the ingestion of 100 gm. of glucose it rose to 500 mg. at the end of two hours, after which it gradually returned to the normal, as is shown by Chart 3. In spite of the high blood sugar content, there was no sugar in the overnight specimen of urine. Sugar appeared in the urine, however, with rise of the blood sugar. The water intake was 850 c.c.; the urine output, 700 c.c.; the sugar intake was 100 gm.; the sugar output, 8.95 gm., as follows: first hour, 0.816 gm.; second hour, 2.34 gm.; third hour, 3 gm.; fourth hour, 2.8 gm.

Comment.—This case was definitely one of severe diabetes with marked hyperglycemia but only transient glycosuria. The glucose tolerance test gave a definite diabetic curve with the excretion of a considerable quantity of sugar. This case shows the importance of the blood sugar estimation in establishing the diagnosis of diabetes, as the diagnosis would have been obscured by urinary analysis alone.

CASE 4.—*History.*—A physician, aged 50, married, whose family history was of no consequence, had had abdominal pain and diarrhea while in the army, losing about 40 pounds while in camp. Following this he had pain in the back for about a year. This returned six weeks before he came to the clinic, when he was running after a car. Six weeks before he had had influenza and he had felt bad ever since. He had been very thirsty of late and had passed much urine of high specific gravity, and containing sugar. Three months before there was no sugar in the urine. The patient was large and well-built, with a blood pressure of 140 systolic and 90 diastolic; there were no other pathologic findings. Blood examination revealed: blood sugar, 374 mg. per hun-

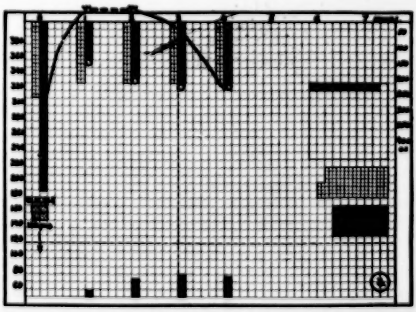

Chart 3.—Blood sugar in Case 3.

dred cubic centimeters; blood urea, 36 mg.; blood chlorids, 625 mg.; blood creatinin, 1.1 mg.; blood uric acid, 6 mg., and blood nonprotein nitrogen, 21 mg. per hundred cubic centimeters. Examination of the urine disclosed the presence of sugar, 3 plus; the Wassermann reaction was negative. A glucose tolerance test six days later gave the following results: fasting blood sugar, 222 mg. per hundred cubic centimeters; after the ingestion of 100 gm. of glucose, the

highest point, 428 mg., was reached at the end of one hour, and the return toward normal was slow (Chart 4). The total water intake was 925 c.c.; total urine output, 470 c.c.; total sugar intake, 100 gm.; sugar output, 10.04 gm., as follows: first hour, 0.9 gm.; second hour, 3 gm.; third hour, 3.4 gm.; fourth hour, 2.66 gm.

Comment.—In this case there was a marked fasting hyperglycemia, yet there was no sugar in the overnight specimen of urine. The case was definitely that of a diabetic. The patient's renal permeability was high, at some point between 200 and 300 mg. per hundred cubic centimeters. Were one to follow such a case by urinary analysis alone, the patient could carry a blood sugar content of about 200 mg. per hundred cubic centimeters with sugar-free urine, and the destructive process of diabetes would go unchecked.

CASE 5.—*History.*—A woman, aged 18, came to the clinic knowing that she had diabetes. Her mother and grandmother died of diabetes. She had been weak all her life. One year before, ulcer of the stomach had been diagnosed, and she had been kept on a Sippy treatment for months. During the last two years her weight had dropped from 130 to 95 pounds. The urine had been examined frequently on account of her family history, but no sugar was found until two months before she came to us. She was very nervous, and had swollen ankles. During the last two months she had been on the Allen treatment, but was not improving. The

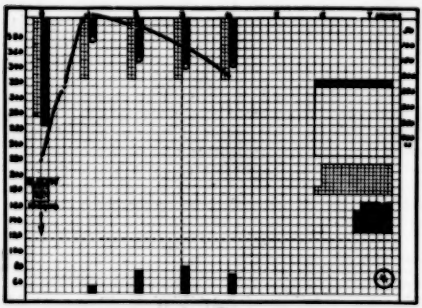

Chart 4.—Blood sugar in Case 4.

patient was a slender, thin girl with a pale skin; the blood pressure was 100 systolic and 70 diastolic; there was slight edema of the extremities; otherwise the patient was normal. Urine examination revealed sugar and a few granular casts; the blood examination revealed blood sugar, 324 mg. per hundred cubic centimeters; blood urea, 12 mg.; blood uric acid, 4.3 mg.; blood chlorids, 585 mg.; blood creatinin, 2.3 mg., and nonprotein nitrogen, 18.2 mg. per hundred cubic centimeters; plasma carbon dioxid, 51.9. The Wassermann reaction was negative. A glucose tolerance test gave the following findings: fasting blood sugar, 272 mg. per hundred cubic centimeters; after the ingestion of glucose the blood sugar curve rose and kept on rising to 584 mg. at the end of four hours, when the test was discontinued (Chart 5). The first urine specimen showed sugar, as did all the others. The water intake was 980 c.c.; urine output, 615 c.c.; sugar intake, 100 gm.; sugar output, 20.81 gm.: first hour, 1.87 gm.; second hour, 4.78 gm.; third hour, 5.80 gm.; fourth hour, 8.36 gm.

Comment.—This is a definite case of severe diabetes, the onset and early stages of which had been overlooked in spite of the fact that, on account of the diabetic history in her family, she had been watched closely—but by urine examination only. This would have been an ideal case for an early diagnosis. If a glucose tolerance test had been made years ago, the prediabetic condition[1] would have been manifested

1. John, H. J.: Ohio State M. J. **17**: 826 (Dec.) 1921.

by a decreased tolerance of carbohydrates; and by a slight reduction of her carbohydrate intake and a checking up from time to time, the girl, no doubt, would have been kept nondiabetic, although with a somewhat lowered tolerance for carbohydrates in contrast to her present condition—that of a severe, very severe, diabetic with but little hope for the future. Such cases as this make one think seriously of the

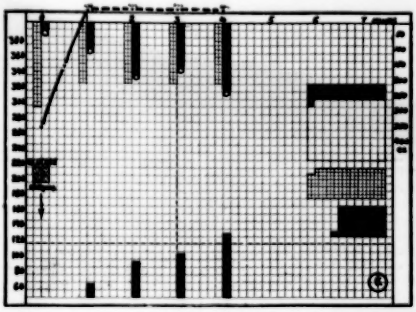

Chart 5.—Blood sugar in Case 5.

responsibility of protecting the children of diabetic parents. Therein lies the solution of the diabetic problem—prevention rather than treatment.[2]

CASE 6.—*History.*—An Italian woman, aged 30, married, with three living and healthy children, with negative family history and a personal history of no significance, complained chiefly of thirst. Her family physician had found sugar in the urine, and she came to the clinic to verify the statement that she had diabetes. Her present illness had lasted for five months, during which she had had marked thirst and polyuria, with itching about the genitals. During this time she had lost 17 pounds in weight. She was well developed but poorly nourished, and appeared ill. Her face was slightly flushed; the pupils reacted to light and accommodation. There was marked pyorrhea alveolaris; the tongue was coated. There was no thyroid or glandular enlargement. The heart and

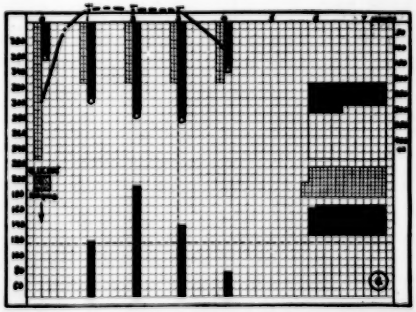

Chart 6.—Blood sugar in Case 6.

lungs were quite normal. The blood pressure was 124 systolic and 80 diastolic. The temperature was 98.2. The abdomen and extremities were negative. The reflexes were equal and active. The skin was dry and harsh. The blood sugar was 306 mg. per hundred cubic centimeters; blood chlorids, 565 mg.; blood urea, 21 mg.; blood creatinin, 1.2 mg.; blood uric

2. This patient has died since the article was written.

acid, 2.5 mg., and blood nonprotein nitrogen, 23 mg. per hundred cubic centimeters; plasma carbon dioxid, 85.3; plasma acetone, negative. The Wassermann reaction was negative. The glucose tolerance test showed fasting blood sugar, 306 mg. per hundred cubic centimeters, the highest rise of 544 mg. being reached at the end of two hours. A gradual return toward the normal followed, the sugar being still 374 mg. per hundred cubic centimeters at the end of four hours (Chart 6). The water intake was 1,050 c.c.; urine output, 990 c.c.; sugar intake, 100 gm.; sugar output, 34.34 gm., as follows: first hour, 7.35 gm.; second hour, 14.50 gm.; third hour, 9.30 gm.; fourth hour, 3.19 gm.

Comment.—This case shows a typical onset of diabetes, without any apparent cause. Italians are known to partake heavily of flour preparations, macaroni, bread, pastries, etc. There is no doubt that this patient had originally a weakened tolerance for carbohydrates. The pancreas withstood the slight but continuous overstrain until it finally "gave out" and could no longer utilize the carbohydrates. The glucose tolerance curve is that of a typical diabetic. We were unable to determine the renal permeability, since the patient started with glycosuria; all we can say is that it lies below 300 mg. for each hundred cubic centimeters.

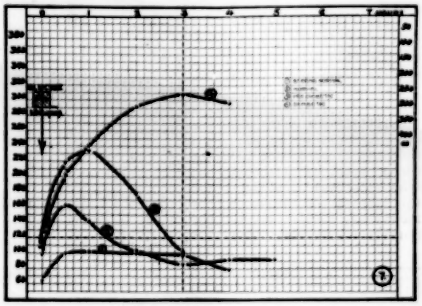

Chart 7.—Typical curves

SUMMARY

The important points that are emphasized by a study of these cases are:

1. The lack of sugar in the urine in typical cases of severe diabetes with a high blood sugar (Cases 3 and 4). These patients undoubtedly do have sugar in the urine periodically, and one may or may not discover it at the time of examination; for often a diabetic needs only to reduce his diet somewhat and to drink a lot of water, in order to become sugar free. In this way the diagnosis may be missed for a long time.

2. Sugar in the urine with a normal glucose tolerance (Cases 1 and 2). These patients had been diagnosed as diabetics, because they had sugar in the urine, and had been subjected to a rigid diet. But they were not diabetics. They had permeable renal filters—thus, the glycosuria. Such cases as these emphasize the point that one cannot afford to stop with the urinary examination alone—blood sugar estimation is essential, with the glucose tolerance test as a final proof.

Many persons like these two have been rejected by the insurance companies in the past—have been considered as bad risks, as diabetics—when in reality they were exceedingly good risks—were perfectly normal individuals.

On the other hand, the same insurance companies have accepted many cases of the Types 3 and 4, just because they had no sugar in the urine, when in reality they had severe diabetes, and were thus exceedingly bad risks. Furthermore, even when a blood sugar estimation is made, what is easier than for a diabetic to go on a low diet, bring the blood sugar to normal, and then present himself for a life insurance

TABLE 1.—DIABETIC PATIENTS SHOWING NO GLYCOSURIA

	Fasting		100 gm. of glucose by mouth	½ Hour Later:	1 Hour Later		2 Hours Later		3 Hours Later		4 Hours Later		
Case Number	Blood Sugar, Mg. per 100 C.c.	Urine Sugar		Blood Sugar, Mg. per 100 C.c.	Blood Sugar, Mg. per 100 C.c.	Urine Sugar	Blood Sugar, Mg. per 100 C.c.	Urine Sugar	Blood Sugar, Mg. per 100 C.c.	Urine Sugar	Blood Sugar, Mg. per 100 C.c.	Urine Sugar	Total Output of Sugar Gm.
7	172	Neg.		265	329	Plus	225	Plus	153	Plus	140	Neg.	0.650
8	126	Neg.		308	327	Plus	267	Plus	226	Plus	170	Plus	4.758
9	132	Neg.		254	256	Plus	241	Plus	208	Plus	150	Neg.	.....
10	155	Neg.		214	267	Plus	334	Plus	334	Plus	175	Plus	.....
11	104	Neg.		306	220	Plus	300	Plus	193	Plus	176	Plus	.....
12	134	Neg.		230	272	Plus	300	Plus	214	Plus	167	Plus	.....
13	200	Neg.		262	333	Plus	250	Plus	192	Plus	194	Plus	.....
14	250	Neg.		334	460	Plus	438	Plus	214	Plus	136	Plus	.....
15	192	Neg.		346	352	Plus	280	Plus	238	Plus	184	Plus	3.04
16	155	Neg.		286	374	Plus	393	Plus	306	Plus	210	Neg.	4.54
17	196	Neg.		315	356	Plus	411	Plus	310	Plus	237	Plus	5.56
18	305	Neg.		300	394	Plus	377	Plus	405	Plus	146	Neg.	11.84
19	233	Neg.		322	376	Plus	430	Plus	265	Plus	157	Neg.	10.85
20	257	Neg.		383	424	Plus	485	Plus	428	Plus	273	Plus	19.90
21	230	Neg.		373	437	Plus	511	Plus	557	Plus	...	.....	8.51
22	129	Neg.		302	323	Neg.	291	Plus	306	Plus	206	Plus	6.03
23	224	Neg.		382	460	Plus	500	Plus	404	Plus	324	Plus	8.956
24	222	Neg.		319	428	Plus	400	Plus	374	Plus	334	Plus	10.04

TABLE 2.—NONDIABETIC GLYCOSURIA

	Fasting		100 gm. of glucose by mouth	½ Hour Later:	1 Hour Later		2 Hours Later		3 Hours Later		4 Hours Later		
Case Number	Blood Sugar, Mg. per 100 C.c.	Urine Sugar		Blood Sugar, Mg. per 100 C.c.	Blood Sugar, Mg. per 100 C.c.	Urine Sugar	Blood Sugar, Mg. per 100 C.c.	Urine Sugar	Blood Sugar, Mg. per 100 C.c.	Urine Sugar	Blood Sugar, Mg. per 100 C.c.	Urine Sugar	Total Output of Sugar Gm.
25	75	Plus		117	59	Plus	53	Plus	63	Plus	62	Neg.	0.207
26	74	Plus		148	115	Plus	65	Neg.	70	Neg.	67	Neg.	0.267
27	100	Plus		125	136	Plus	123	Plus	89	Plus	91	Plus	0.773
28	121	Plus		127	130	Plus	117	Plus	143	Plus	73	Plus	.....
29	111	Plus		151	145	Plus	77	Plus	77	Plus	88	Plus	0.266
30	89	Plus		62	143	Plus	109	Plus	55	Neg.	72	Neg.	1.297
31	96	Plus		102	141	Plus	103	Plus	77	Plus	91	Plus	0.037
32	130	Plus		174	151	Plus	98	Plus	106	Neg.	83	Neg.	0.540
33	103	Plus		184	161	Plus	103	Plus	91	Plus	81	Neg.	0.114
34	108	Plus		123	145	Plus	117	Plus	100	Neg.	..	.....	0.287

examination and successfully pass the test? But, while a patient with a severe case of diabetes can temporarily bring his blood sugar to normal or can render his urine sugar free, yet no diabetic or prediabetic patient (which is just as important) can produce a normal blood sugar curve after the ingestion of 100 gm. of glucose. This will always be of the diabetic type, and will reveal the true state of affairs.

CONCLUSION

1. In the presence of sugar in the urine, before a diagnosis of diabetes can be definitely established, a fasting blood sugar estimation should be made to ascertain whether the urinary sugar is due to a true diabetes or merely to a permeable renal filter.

2. The true carbohydrate tolerance of a person can be obtained by glucose tolerance estimation such as has been outlined in this paper.

3. Children with a diabetic inheritance should always be subjected to a glucose tolerance test, as the development of diabetes can thus be established before the ordinary tests can give any clue.

4. The presence of glycosuria indicates one of two things: (1) a true disturbance of carbohydrate metabolism, i. e., diabetes, or (2) a permeable renal filter, i. e., not diabetes.

Euclid Avenue at Ninety-Third Street.

STUDIES ON THE THERMAL DEATH TIME OF SPORES OF CLOSTRIDIUM BOTULINUM

PRELIMINARY REPORT *

ERNEST C. DICKSON, GEORGINA S. BURKE, DORTHY BECK, JEAN JOHNSTON AND HARRIET KING

SAN FRANCISCO

As a part of the investigation of botulism in California, experiments were undertaken at Stanford University to determine the thermal death time of the spores of *Clostridium botulinum* under conditions which may apply in the processing of preserved foods. It is proposed to publish the details of this investigation in monograph form in the Stanford University Publications, but because of the importance of some of the observations it is deemed advisable to place them on record in a preliminary report.

The secret of obtaining sufficient quantities of spores for the investigation was found to lie in providing a medium suitable for rapid and profuse growth of the organism. There is considerable variation in the growth of *Clostridium botulinum* under given conditions, and unless there is a profuse initial vegetative growth the occurrence of sporulation is very scanty. The majority of strains examined grew well and produced numerous spores in peptic digest glucose broth of p_H 7.0 to 7.5, but for some strains it was necessary to provide gelatin-vegetable-juice mixtures, pea gelatin, spinach gelatin or bean gelatin, and, for others, brain or meat mediums in order to obtain sufficient spores.[1]

In every instance the purity of the strain was carefully tested before the medium was inoculated. The cultures were incubated at 37 C. for two weeks and then stored at room temperature. The contents of each bottle were tested for purity of growth before they were used in heating experiments, and the number of spores per cubic centimeter was determined by actual count in an Elei counting chamber. Preliminary resistance tests were made of forty strains from which the more resistant were selected for subsequent experiments.

In the earlier experiments we adopted the method of heating the spores which was recommended by Bigelow and Esty,[2] with minor modifications; but because of the difficulty in preventing contamination when several hundred tubes were inoculated daily, a closed tube technic, which was described in a previous report,[3] was substituted. In this closed tube technic the spores are added to the medium in which they are to be incubated, and the mixture is sealed into small glass tubes before it is heated. There can thus be no contamination of the spore-bearing mixture after it has been heated, and any growth which may occur within the tube must be from some spore or bacterium which has survived the heating process. It is believed that this absolute prevention of contamination more than offsets any disadvantages which may lie in the sealed tube method.

The tubes were heated in electric oil baths in which the temperature was kept constant by thermostatic regulation and the oil actively agitated by a mechanical stirring device. The temperature was closely checked by means of several thermometers suspended in different portions of the bath.

The time required for penetration of the heat into the tube, i. e., the lag, was determined in each experiment by standardized thermometers immersed in oil within tubes, since this method was demonstrated by means of thermocouples to approximate closely the readings obtained in the sealed tubes. The error which exists is on the side of safety, since it requires slightly longer for the thermometer to register than is actually demonstrated by the thermocouple.

After the tubes were heated they were immediately cooled and labeled, and were incubated at 37.5 C. for one month, after which they were kept at room temperature. When growth was observed they were incubated again at 37.5 C. for ten days to allow for toxin formation. The contents of the tubes were then tested for characteristic growth and the presence of virulent toxin.

In this report, unless the contrary is specifically stated, all results were obtained by the closed tube method of heating.

RESULTS

1. There is very marked variation in the heat resistance of spores of different strains of *Clostridium botulinum*. In the preliminary open tube tests of forty strains heated at 100 C. it was found that the survival times varied between thirty minutes and six hours. Some of the most resistant strains were Type A and some were Type B.

2. There is considerable variation in the resistance of spores in the same culture of the same strain of

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* These experiments are a part of an investigation on botulism which was made in California by the U. S. Public Health Service, Stanford University and the University of California under a grant from the National Canners' Association, the Canners' League of California and the California Olive Association.

1. The formulas for the different mediums will be discussed in the later report.

2. Bigelow, W. D., and Esty, J. R.: The Thermal Death Point in Relation to Time of Typical Thermophylic Organisms, J. Infect. Dis. **27**: 602 (Dec.) 1920.

3. Dickson, E. C., and Burke, G. S.: A Method for Determining the Thermal Death and Time of the Spores of Bacillus Botulinus, Proc. Soc. Exper. Biol. & Med. **19**: 99, 1921.

Clostridium botulinum. When series of duplicate sets of tubes are heated, it is noted that there is no sharp line of demarcation on one side of which it can be said that all the tubes show growth and on the other side of which all are sterile. There is considerable irregularity, with the occurrence of skips, which show that in some tubes which have been submitted to a longer exposure to heat, the spores have survived, whereas in others in which the exposure was considerably shorter, they were all destroyed. Similar results were observed by actual count of surviving bacteria in sets of agar tubes. In the tubes which show surviving spores there is a gradual decrease in the number up to a certain point, at which the drop is sudden and beyond which but few survive. Beyond this point there may be persisting growth after considerably longer exposures to heat, although only one or two colonies develop in each tube.

From observations based on approximately 40,000 tubes, it appears that about 95 per cent. of the spores are destroyed comparatively quickly, and that among the remaining 5 per cent. there are a few spores which are much more resistant. If this is true, it explains why only a few tubes in a series show the maximum heat resistance time, or a few cans in a pack show botulinus contamination, and also suggests as a reason for the average lower resistance time when but few spores are present in the heating mixture, that among the few spores there is less probability of a highly resistant spore being present.

3. There may be very marked delay of germination of spores of *Clostridium botulinum* after they have been heated. In practically all experiments it was noted that some of the tubes would remain apparently sterile for weeks or months after the others had shown growth, but would eventually show vigorous growth with toxin formation. The longest delay which has thus far been observed is 330 days.

The causes of this delayed germination of heated spores are not yet apparent. An analogous condition occurs in normal, unheated botulinus spores, but has not been demonstrated for so long a time. Whether the heating increases the normal tendency to dormancy or whether the dormant normal spores are the more resistant ones has not been determined.

MAXIMUM SURVIVAL TIME IN MINUTES OF SPORES OF CLOSTRIDIUM BOTULINUM WHEN HEATED AT DIFFERENT TEMPERATURES IN DIFFERENT SUBSTRATA

Temperature Heated in Degrees C.	Broth	Brain	Oil Stratified Broth
100	225	270	315
107.5	40	45	80
113.5	7	10	42
121	4	6	22

4. The age of spores which have been kept at room temperature in the culture medium in which they developed does not materially influence their resistance to heat after their equilibrium of resistance has been reached. It was found that spores in a culture aged 22 days were considerably less resistant than those in a culture of 66 days, but that between 66 and 315 days the resistance was practically constant.

5. The reaction of the material in which the spores are heated plays an important part in determining their resistance to heat. The maximum resistance exists when the medium is approximately neutral, and rapidly decreases as the hydrogen-ion concentration approaches both the acid and alkaline ranges. There is a much narrower zone of greater resistance at higher than at lower temperatures.

Parallel studies of hydrochloric, citric, acetic and lactic acids by sealed tube technic were complicated by the fact that the bacteria were incubated in the mediums in which they had been heated; but there seemed to be no appreciable difference in the resistance of the spores at corresponding hydrogen-ion concentrations of these acids.

6. The kind of medium in which the spores have grown does not seem to influence their heat resistance, but there is a variation in the heat resistance, depending on the type of substratum in which they are heated, which is not dependent on any difference in reaction.

When spores are heated in broth of approximately neutral reaction, they are more quickly destroyed than when they are heated in brain medium of like reaction; and if a thin layer of oil is placed on the surface of the broth, there is a greatly increased survival after the heating process.

7. The maximum survival times for *Clostridium botulinum* which have thus far been obtained in this series of experiments in sealed tubes are shown in the accompanying table. It will be noted that the survival time at 100 C. falls considerably short of that obtained in open tubes, which was six hours.

INTENSIVE DEEP ROENTGEN IRRADIATION

A STUDY OF THE IMMEDIATE EFFECTS

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My observations are based on a series of 100 intensive deep roentgen irradiation doses that I have applied since therapeutic apparatus for this purpose has become available in this country. The term "intensive deep irradiation dose" is used to describe a quantity of roentgen rays that is absorbed by deep tissues and sufficiently large to bring about certain biologic and clinical results.

I record primarily the observations concerning the immediate effect of this newer method of roentgen irradiation on the patient, and the physical reaction.

It is well established that the absorption of large irradiation doses leads to certain more or less transient effects on the patient. Recourse to this newer form of therapy is, therefore, determined not only by the probable local result but also, and properly, by the effect that exposure to the intensive irradiation will have on the individual.

Understanding of the effect of irradiation depends on one's conception of the process of intensive deep irradiation. To avoid the use of technical terms in which workers in this field have come to think, I shall briefly describe, as the basis for these observations, the factors that determine the character of the irradiation.

TYPE AND QUANTITY OF ROENTGEN RAYS

The roentgen rays applied in this series were produced at a voltage of from 200,000 to 220,000, using a Coolidge deep therapy tube. They were filtered through copper filters, from 0.5 to 1 mm. in thickness, according to the penetration and depth dose desired. An area of entrance of the rays was as large as possible, but not exceeding, as a rule, 20 by 20 cm. In

one case the area included an entire side of the chest. The distance from the anode to the skin varied in different cases between 50 and 80 cm., depending on the depth dose desired.

The unit of measurement in this series is the erythema dose, as determined by Wintz, or the quantity of ultrahard rays, absorbed by the skin, which produces an erythema in ten days in the average case. His "carcinoma dose" is from 100 to 110 per cent. of this surface dose of ultrahard rays administered deep into the body tissues. The required dose for certain other pathologic conditions has been determined as somewhat less. The measurements were made by the Wintz iontoquantimeter, and the transformer, the tube and the filter were carefully calibrated by this instrument, which is reliable. All results in deep roentgen therapy in German clinics have been made possible only through the advantages of the iontoquantimeter.

PROTECTION OF THE PATIENT

Irradiation effects are due primarily to the amount of roentgen rays absorbed by the tissues through the treated areas. The effects may be aggravated by unwonted absorption through insufficiently protected areas that are not being treated, and through continuous breathing of the contaminated air that is often present in the treatment room. In my cases, the diffusion of the rays was limited as much as possible by the usual lead glass tube holder and lead-rubber treatment cones. The patient is covered entirely with heavy lead-rubber, except over the treated area. The possible absorption of extraneous rays is thereby reduced to a minimum. The absence of wires eliminates corona discharges, and thorough ventilation eliminates even traces of nitrous gases. The patient rests on an insolated table.

All treatments had for their aim the administration of the required dose in one sitting, or as few sittings as the patient's condition permitted. The longest exposures have been in the most superficial cases. The longest continuous exposure lasted six hours; other cases have required two periods of four hours each in one day; one patient with traumatic sarcoma of the thigh, with metastases in both lungs, received three sarcoma doses within ten days.

GENERAL EFFECTS

The general constitutional effects have been surprisingly mild. The patients have felt somewhat indisposed; loss of appetite sometimes persisted for a week. Occasionally there was some nausea, but rarely vomiting. None of my patients reacted so badly as to become confined to bed from irradiation effects, although they had received full irradiation doses of the type described, through rather large masses of tissue. In general, the unpleasant effects from hard rays have been very much less noticeable than from soft rays.

Blood examinations tend to confirm the conclusion of other investigators, that no matter what region is subjected to irradiation, there is a marked effect on the blood-forming organs. Within the first three days there is generally a marked reduction of lymphocytes, and often an improvement in the red cell count. At the end of a week, the blood picture begins to be restored, and at the end of six weeks it has approached the normal again in favorable cases.

The blood counts in the accompanying table illustrate the effect of heavy irradiation.

A rise of temperature amounting to not more than a fraction of a degree was observed now and then. It was sharply defined after irradiation of the liver for metastatic sarcoma, as shown in the accompanying chart.

EFFECT OF INTENSIVE DEEP ROENTGEN IRRADIATION ON BLOOD PICTURE*

Date	Per Cent. Hemoglobin	Red Blood Cells	White Blood Cells	Polymorphonuclears	Eosinophils	Basophils	Lymphocytes: Large	Lymphocytes: Small	Transitionals	Myelocytes	Large Mononuclears	Area Irradiated
Before irradiation												
1/19/22	80	5,135,000	6,225	56	7	..	3	33	..	..	1	
After irradiation												
1/23/22	80	5,120,000	5,225	66	2	..	2	26	4	..	..	Thigh
1/26/22	80	5,020,000	5,850	66	6	..	3	24	1	..	..	Thorax
1/30/22	80	4,750,000	3,950	69	3	..	3	21	4	..	..	Thorax
2/ 4/22	80	4,430,000	3,800	65	8	3	4	20	..	..	..	Thigh
2/10/22	80	4,740,000	3,750	4	10	..	14	3	..	..	1	
Patient discharged from hospital; period of recovery; no further irradiation until March 18, 1922.												
Before new irradiation												
3/18/22	..	4,600,000	5,350	50	..	..	1	28	9	..	..	
After new irradiation												
3/28/22	.....	4,120,000	3,750	62	..	..	6	22	..	..	..	Thigh
4/ 3/22	70-80	4,180,000	3,950	68	..	..	4	27	1	..	..	Thorax
4/ 7/22	70-80	4,040,000	3,350	62	1	..	4	24	6	..	3	Thorax
Period of recovery; no further irradiation until June 27, 1922.												
Before new irradiation												
6/27/22	70-80	4,530,000	4,975	60	4	2	2	29	3	..	..	
After new irradiation												
6/30/22	70-80	3,700,000	5,550	74	1	..	2	23	..	..	..	Liver
7/ 1/22	70-80	3,630,000	5,600	65	..	..	1	34	..	..	..	Thigh
7/ 6/22	70-80	4,450,000	3,550	63	4	2	4	23	4	..	..	

* The patient was being treated for sarcoma of the thigh with metastases in both lungs and in the liver. Dates under "after new irradiation" designate time of separate doses.

LOCAL EFFECTS

The local effect is manifested on the skin, on the superficial organs such as glands, and on the organs subjected to irradiation.

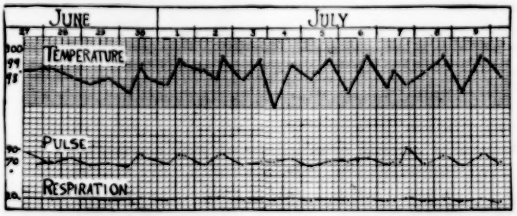
The Skin.—An erythema was produced in all cases in which the full dose was administered through one area. It varied in degree with different persons. When the pathologic tissue was situated close to the surface, I was required to administer very full erythema doses. In one case of multiple, superficial, large carcinomatous masses, there appeared immediately after treatment three areas of erythema that remained three weeks, with the rather annoying accompaniments of a dermatitis of that degree. The skin recovered fully without denudation, and in six weeks the carcinomatous masses had disappeared, with the exception of a still palpable axillary gland. In the course of these treatments I have not seen blisters produced, necrotic areas, or telangiectases of the skin.

The erythema is followed by a transient, faint browning of the skin.

When more than one area may be utilized for entrance of the rays, it is rarely necessary to produce an erythema, because the skin dose may be so apportioned on the basis of iontoquantimeter calculations that an erythema is avoided.

The Glands.—There is usually an enlargement of the superficial lymphatic glands in the irradiated region, which subsides after two or three days. When the region of the neck is irradiated, the effect on the salivary glands leads to an annoying dryness of the mouth, and there is usually an enlargement of the parotid glands. In one case of sarcoma of the nasopharynx, I administered the full sarcoma dose in one sitting of four hours. Because of the massive glandular involvement on each side of the neck, it was to be expected that the salivary glands could not be spared. The sarcomatous masses disappeared entirely within twenty-two days, but the trying dryness of the mouth remained for months.

The Nerves.—It is worthy of record that in two cases in which the chest was irradiated, a true herpes zoster occurred soon after the irradiation. One was a case of metastatic carcinoma of the lungs, and the other was an inoperable case of cancer of the breast. The herpes occurred in the latter case on the side of the lesion. The rays had been applied only from the anterior aspect. I cannot prove any causative relationships between the disease, the treatment and the herpes.



Small but well-defined rise in temperature after irradiation, July 1; temperature previously normal (sarcoma).

The Lungs.—Full irradiation doses, applied to the lungs for cancer or sarcoma, gave rise to a feeling of "tightness in the chest." There was bronchial irritation in each instance, and in the case of metastatic carcinoma of the lungs, from mammary cancer, there was slightly blood-streaked sputum for several days. It is my opinion that these manifestations correspond to a surface erythema reaction.

The Esophagus.—I have observed a marked immediate effect in only one case of temporary complete cancerous occlusion of the lower portion of the esophagus. The patient was unable to swallow either hot or cold water on the day of the treatment. Twelve hours after the intensive irradiation, the patient telephoned me that he was able to swallow a cupful of water "and two bottles of pop." This man was able to take soft food without regurgitation during three weeks after that, when occlusion again occurred. A second treatment permitted him to take food for another three weeks, again followed by occlusion. At that time a gastrostomy was performed for relief. The patient died in about one month after operation.

The Bladder.—Immediate effects have been observed in malignant disease of the bladder, as evidenced by production of subjective symptoms, or modification of symptoms, and by cystoscopic examination, and in cases in which the bladder was not directly involved but bladder symptoms were produced by involvement of the vesicovaginal wall. In intravesicular disease, I have found the bladder exceedingly sensitive to roentgen irradiation. The bladder irritability was much increased. If there was pain prior to the irradiation, it became more severe after the treatment. All the subjective symptoms subsided in the measure that the local condition improved. When there was bladder irritability from involvement of adjoining organs, I have observed entire disappearance of this complaint from the moment that deep irradiation was applied.

When there was discharge of blood and pus from the bladder in the course of the disease, this discharge became gradually less in the course of a week after the irradiation. A noteworthy observation was the presence in the urine of shreds of necrotic tissue after the administration of carcinoma irradiation doses to the bladder.

Cystoscopic Observation.—In a number of cases I had the advantage of cystoscopic observation of the bladder wall of patients suffering from carcinoma of the bladder. The patients were observed immediately prior to, and one week after the irradiation. The immediate effect on the malignant ulceration, as seen one week after the irradiation, was, to use the surgeon's own words, "miraculous; the ulcerated area decreased one-half in size." In other cases the information was that the mass was sloughing. In all these cases there was observed a strong reaction in the bladder wall. Since a full erythema depth dose was given, controlled by iontoquantimeter measurement, the local reaction, which was expected, undoubtedly corresponds to a surface erythema. The reaction, in connection with the demonstrated necrotic process in the malignant mass in the bladder, tends to support the theory advanced by some pathologists that the disappearance of malignant tumors in some areas and in some tissue elements, after irradiation, is possibly due to the effect of the irradiation on the blood vessels supplying the neoplasm, causing their obliteration and, consequently, necrosis in the mass. It is possible that this process has its effect on the type of carcinoma occurring in the bladder.

The Abdomen.—After full erythema doses to the deep abdominal tissues, I have regularly observed increased intestinal irritability, evidenced by more frequent evacuations. The systemic effects are more noticeable, and the nausea occurs rather promptly. In a case of tuberculosis of the peritoneum, in which for some time before their irradiation a gallon of fluid had been aspirated every two weeks, there was no further exudate after the second dose, and the tuberculous masses, formerly very distinct and palpable, had entirely disappeared.

SUMMARY

1. Large doses of intensive, deep roentgen irradiation with ultrahard rays, with proper precautions, have been safely administered to patients who were not cachectic.

2. The general systemic effect is, under these conditions, less distressing than formerly, after irradiation with the soft rays.

3. The immediate effect on the blood and blood-forming organs is marked, but restoration begins as a rule within a week after the irradiation in noncachectic cases. Hemorrhages from internal malignant growths ceased; this result alone is of immediate benefit to the patient.

4. The immediate effect of therapeutic doses on the deeper organs in irradiated areas is that of irritation, and probably corresponds to a surface erythema. Glandular tissues may be destroyed.

5. In noncachectic patients, a surface erythema from these ultrahard rays was safely produced when necessary. It must be attained whenever a malignant mass near the surface is to be treated through one area of entry.

6. The iontoquantimeter permits the administration of the desired and known depth dose, and is the basis of scientific deep roentgenotherapy.

11½ East Eighth Street.

THE SIMULTANEOUS OCCURRENCE OF TUMORS IN THE THYROID, UTERUS AND BREAST

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AND
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DETROIT

Every surgeon who operates upon goiters must have noticed the frequent occurrence of tumors in the thyroid, uterus and breast. Apparently there has been very little written on the subject, however, for we could find only two references in the literature. Falta's [1] "Ductless Glandular Diseases" contains this note:

> There seems to exist a certain relationship between goiter and myomata of the uterus. At least it has been observed that in strumous women who also suffer from myomata the struma also decreases in size with the retrogression of the myoma at the menopause.

Falta's note is quoted from an article by Ullman [2] of Vienna. This article reads:

> It has been known for a long time that a relationship exists between the uterus and the normal thyroid gland. The nature of this relationship is, of course, enshrouded in darkness; we only know that in a not infrequent number of women a transitory enlargement of the thyroid gland takes place at the time of menstruation. After the cessation of menstruation, the thyroid returns to normal. . . . In many women during pregnancy an enlargement of the thyroid takes place, which still exists after childbirth. . . . A third fact which concerns the question of the relationship between uterus and thyroid is that as to whether strumas develop more frequently in females then in males. . . . I wish to emphasize that in women affected with myomas I was able to show a distinct enlargement of the thyroid gland, an enlargement that could be spoken of partly as struma parenchymatosa, partly as the result of degeneration, as colloid struma. . . . I was then able to determine that these strumas following complete myomectomy became decidedly smaller; in many cases they disappeared entirely.

In looking over our own records, we find that of the last 100 female patients who consulted us for goiter, eighteen had fibroids; [3] four of them also had breast tumors; and of the last 100 patients who consulted us for fibroids, thirty-five had goiter; six had breast tumors. Thus, of the total 200 patients, fifty-three, or 26.5 per cent., had tumors of both thyroid and uterus. Ten of these 200 patients required operations on both the thyroid and the uterus. This large number of multiple lesions is obviously much more than a coincidence; yet, as noted above, very little mention of it has been made.

The matter therefore seemed important enough to call attention to again. Three points suggest themselves:

(*a*) It is possible, as suggested by Ullman, that certain goiters might be reduced in size or even cured by removal of a fibroid.

(*b*) Thyroid extract and iodin might be beneficial in preventing the development of fibroids as well as of goiters.

(*c*) These relationships might have some bearing on the etiology of these tumor groups.

In the eighteen goiters found in the examination of 100 fibroids, fourteen were adenomas of the thyroid, three were colloid goiters, and one was an exophthalmic goiter. Of the four breast tumors which accompanied goiters, an adenofibroma with cyst-areas accompanied an adenomatous goiter; an adenoma of the left breast accompanied an adenomatous goiter; an intracanalicular adenofibroma in the right breast, and a similar tumor with hyaline changes in the left breast accompanied a colloid adenomatous goiter. Another goiter which is not tabulated showed virginal hypertrophy of the right breast. Of the six breast tumors which accompanied fibroids, three were interstitial mastitis; one was a fibro-adenoma; one was a carcinoma of the left breast and fibro-adenoma of the right breast, and one was a cystadenoma.

Of the fifty-three patients with the combination of goiter and fibroid, the youngest was 25 years old, this patient being the only one below 30. Fully two thirds were over 35. We may say, therefore, that the incidence mounts with age, the simultaneous occurrence of goiter and fibroid being most prevalent in the latter half of the third decade and during the fourth decade. Of the 100 goiter patients, twenty-one were under the age of 25. There were no fibroids among these patients, so that the percentage of eighteen fibroids is borne by seventy-nine patients more than 25 years of age. In other words, the fibroid-goiter combination shows its entire incidence after 25 years of age, and increases rapidly after 35 years.

The simultaneous occurrence of goiters, fibroids and breast tumors is more frequent than is usually supposed. The thyroid, breast and uterus have different anatomic structures and are different in their embryologic origins, but we note that the function of the thyroid is closely related to, and influences the function of the sexual organs. The interrelationship of uterus and breast is obvious. Since these organs are related to each other only by function, it must be that physiologic interdependence is a factor in the tumor formation.

When sexual function ceases or begins to wane, usually the time arises for the growth of all these

1. Falta, Wilhelm: Ductless Glandular Diseases, Philadelphia, P. Blakiston's Son & Co., 1916, p. 156.
2. Ullman, Emmerich: Ueber Uterusmyom und Kropf, Wien. klin. Wchnschr. **23**: 585, 1910.
3. Though some patients had large uteri, no diagnosis of fibroid was made unless there was a certainty of this condition.

tumors. The symptoms of fibroids usually become more alarming toward the end of the reproductive period. The adenomatous goiter, in the great majority of cases, does not give much discomfort until the menopause. Then pressure and toxic symptoms arise. Small tumors in the breast have often existed from the age of 20 to the age of 40 without giving any symptoms, or without having been noticed at all; still, their long-standing existence usually is clear when their presence becomes obvious through growth or discomfort. Because of the aforementioned functional (physiologic) relationship which exists between thyroid, uterus and breast, we may be able to understand why growth or irritation in one of these organs may induce growth or irritation in another. For instance, when a small fibroid which has existed innocently for many years suddenly begins to grow, it may induce growth or irritation in the thyroid or breast (and vice versa).

CONCLUSIONS

1. In a series of 200 cases (100 fibroids and 100 goiters), fifty-three patients, or 26.5 per cent., had both goiter and fibroid. Five per cent. had breast tumors.

2. The age of incidence of these combinations was greatest after 35.

3. Since these three organs are not related anatomically or embryologically, the simultaneous occurrence of tumors in the thyroid, uterus and breast may be explained by their physiologic interrelationship.

4. The prophylactic treatment now advocated, of giving iodids for goiter, may likewise prove beneficial in the prevention of fibroid.

5. Perhaps certain goiters can be reduced in size or even cured by the removal of a fibroid (as suggested by Ullman).

269 Rowena Street.

Clinical Notes, Suggestions, and New Instruments

REPORT OF A CASE OF FULL TERM ABDOMINAL PREGNANCY

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A colored woman, aged 33, married, was admitted to Grady Hospital, Dec. 3, 1920, complaining of weakness and pain in the right lower abdomen. She had always been in good health and gave no history of serious illness, operations or venereal disease. Her menses had been regular. She had had three full term, normal pregnancies and labors with normal puerperia, the last one occurring in 1917. There had been no miscarriages.

The menstrual periods were regular and normal during the summer and fall of 1920, and the October period began at the regular time but was more profuse than usual, and lasted two weeks. From this time on, the periods remained absent. During the latter part of October and during part of November, she was nursing a sick relative and thought that the strain of lifting the patient caused pain in the right lower abdomen. She gave no history of a sudden sharp pain or fainting attack. The pain in the right lower abdomen continued throughout November, and was associated with considerable weakness.

She came to the hospital early in December, 1920, complaining of pain in the right lower abdomen, and weakness. She was repeatedly questioned and examined during her stay of one week. Examination disclosed a mass in the middle lower abdomen of the size, shape and consistency of a normal four months' pregnancy; the lower abdomen seemed to be more than normally tender, especially in the right lower quadrant. The skin showed a yellowish pallor. Vaginal examination revealed a moderately firm cervix in normal position and apparently continuous with the mass described, although the tenderness of the abdomen prevented satisfactory palpation. The fornices were soft, and no mass was palpable on either side, although there was more tenderness on the right. Had the patient been examined under anesthesia with, perhaps, a puncture and aspiration of the cul-desac to endeavor to demonstrate the presence of free blood in the pelvis, the true condition might have been recognized; but as there seemed to be no apparent cause for her complaint, she was discharged and not seen again until readmission to the hospital, June 3, 1921.

The pregnancy had apparently progressed normally except for more pain than she had ever experienced with her previous gestations. On examination, the skin showed a yellowish, anemic tint with some pallor of the mucous membranes. The heart and lungs were normal. The blood pressure registered 135 systolic and 90 diastolic. The size and contour of the abdomen were quite typical of a full term intra-uterine pregnancy, except perhaps for a somewhat more abrupt rise above the pubes than normal. A moderate degree of hydramnios was suspected on account of a fairly definite fluid wave and the shiny appearance of the skin. There was more than normal tenderness to palpation. The fetal parts were distinctly palpable, but not to a greater degree than in many thin walled multiparous uteri. The position of the fetus was readily recognized as left sacro-anterior, and the fetal heart sounds were distinctly heard to the left and above the umbilicus. The inlet measurements were normal. Rectal examination revealed no dilatation of the cervix and, although the patient complained of irregular pains, no definite contractions were noted. However, as labor was likely to begin at any time, the patient was kept in the ward under observation. After several days, an attempt was made to induce labor with castor oil and quinin, but without success.

June 8, the patient ceased to feel movements, and repeated examinations failed to reveal fetal heart sounds or movements. It was deemed best not to interfere but to let labor come on naturally, if possible, and the patient was permitted to go home for a few days.

She returned to the hospital, June 23, and stated that bleeding had commenced, June 21, and still continued. She had also been feeling worse during the last week on account of increased backache, feeling of weight in the pelvis, and a foul taste in the mouth. During the next two days, an afternoon rise of temperature to 100 F. was noted. Examination revealed the same physical findings as before, but the cervix seemed slightly more open, although only moderately softened.

It was decided to induce labor on account of the delay in expelling the dead fetus and the evidence of beginning infection, as there seemed to be no other cause for the rise in temperature. June 25, 3 p. m., two large rubber catheters were passed through the cervix. It was noted that the catheters seemed to encounter a firm obstruction after passing in about 10 cm., but this was thought to be, possibly, the placental implantation. On the 26th, at 8:30 p. m., the catheters were removed, no definite pains having resulted. However, the cervix was now dilated sufficiently to admit one finger. On the 27th, at noon, a No. 4 Voorhees bag was introduced through the cervix. The canal seemed to lead off to the left. The membranes could not be reached. On the 28th, at 5 p. m., the bag was removed, as no definite pains had resulted. Examination after removal of the bag revealed that the cervix was dilated about three fingers' breadth and, on further exploration, was found to lead into a cavity about 10 cm. in depth, manifestly a nonpregnant uterus.

The probable diagnosis, therefore, was an extra-uterine pregnancy which must have ruptured at an early stage and retained sufficient attachment to develop to full term as an abdominal pregnancy. It was also possible, but less likely,

that the patient had a double uterus with pregnancy in one side.

The patient was visibly weaker and beginning to appear septic. The temperature had reached 101 F., the pulse was more rapid, from 110 to 120, and the abdomen becoming more tender. An area of tympany in the umbilical region was interpreted as due to adherent intestines in this region. The white blood count was 18,600, with polymorphonuclear cells 81 per cent. and hemoglobin 55 per cent. The urine showed heavy albumin, with many granular and hyaline casts. The contents of the sac were evidently becoming infected, and operation was urgently indicated.

June 29, under gas-oxygen anesthesia, a vaginal examination revealed that the uterus was only slightly enlarged, about the size of a six weeks' pregnancy, and displaced to the left, lying almost parallel to Poupart's ligament. At the beginning of the operation, hypodermic stimulation with caffein and intravenous injection of 500 c.c. of physiologic sodium chlorid solution with epinephrin were given. When a midline incision between the pubes and umbilicus was made, the wall of the sac was firmly adherent to the parietal peritoneum and accidentally opened, releasing a large amount of gas and brownish fluid of foul colon odor. An 8 pound (3.6 kg.) macerated female infant was removed and, after complete evacuation of the fluid, the sac was seen to be completely isolated from the abdominal cavity. The placental end of the cord led up toward the liver, from which it could not be traced. The placenta seemed to be in the pelvis, but, when I attempted to locate it more definitely, a sharp hemorrhage occurred in the pelvis, which fortunately was controlled by the pressure of a hot pack as there was no definite blood supply to be clamped off. The pelvic organs were completely covered over by the sac wall, which had a roughened, somewhat necrotic appearance. A piece of dry gauze was placed over the site of the hemorrhage and three large cigaret drains were placed to drain the sac, through the lower end of the incision, which was closed to this point. The patient's condition remained satisfactory throughout the operation, and she reacted quickly.

July 4, the gauze was removed and, on the 11th, the drains were removed. On the 20th, the wound had broken down and the placenta appeared in the depth of the cavity. July 27, and, again, August 3, two large pieces of necrotic placenta were successively extruded and easily lifted out, leaving the wound quite clean and granulating rapidly. There was no fever after August 2. The patient was allowed out of bed, August 13, and discharged from the hospital on the 21st, with the wound practically closed.

COMMENT

Dr. Beck[1] reports a case of abdominal pregnancy, and analyzes 262 cases compiled from the literature from 1809 to 1919. He urges that every case be reported and states, in his conclusions, that the interests of the child should be considered; that interference at the thirty-eighth week of gestation offers the best chance of saving the child and is associated with less operative risk than at any other time; that preliminary preparation for hemorrhage should precede the operation; that it is best to remove the placenta if it is possible first to ligate its blood supply; otherwise it should be left in and the abdomen closed without drainage, as it will ultimately be absorbed, although occasionally it may become infected from the intestines and subsequently require drainage; and that marsupialization is indicated in those cases in which the blood supply of the placenta cannot be controlled, or hemorrhage requires a tampon, or infection necessitates drainage.

It was unfortunate that the diagnosis of abdominal pregnancy was not suspected in this case, in the early stages of the pregnancy or at the termination of the pregnancy before the fetus died, as an operation undertaken a few days earlier would have saved the child as well as the mother. However, the absence of a history suggesting ectopic pregnancy, and the omission of an examination under anesthesia to clear up the doubtful physical findings, delayed the true diagnosis until efforts were made to induce labor. The obscure anatomic relations of the placenta and its blood supply, the hemorrhage set up by manipulations, and the presence of infection made it necessary to drain, and to depend on the patient's own resistive powers to absorb or extrude the placenta, control the infection, and restore her to health.

20 Ponce de Leon Avenue.

1. Beck, A. C.: Treatment of Extra-Uterine Pregnancy After Fifth Month, J. A. M. A. 73:962 (Sept. 27) 1919.

LIGATION OF FEMORAL ARTERY IN MIDDLE THIGH

J. M. DODD, M.D., ASHLAND, WIS.

J. K., a man, aged 25, laborer, April 4, 1921, while employed on the construction of an ore dock, was struck by an iron rod about 20 feet long and 1½ inches in diameter, which fell from the work above him. It came down endwise, struck him in the middle of the left thigh, and passed down through the popliteal space and out of the outer side of the leg about the middle and on to the ground, fracturing the fibula in addition to inflicting severe lacerations of the soft parts. No serious hemorrhage occurred at the time, nor was there more than slight primary shock.

The man was taken at once to the hospital, and the wound track was cleared of débris. The femoral artery could be felt pulsating in the upper wound, the rod having passed in front and to the outer side of the vessel and behind the popliteal artery, the leg being slightly bent when struck. A dressing was applied, and the patient was put to bed. All went well for six days, when suddenly, without warning, the wound in the thigh began to bleed copiously. Being in the hospital and near at hand, I was able to check the bleeding and apply a ligature to the bleeding point. The case then pursued a normal course for six days more, when, being in the vicinity of the ward, I heard the patient cry out and, hastening to him, found the wound bleeding again most seriously. Hastily removing the dressing and placing a thumb in the wound over the artery, I was able to control the bleeding until instruments could be procured. I then clamped the femoral artery in the upper and lower angles of the wound, and had the patient removed to the operating room. The femoral artery had been injured, erosion had taken place, and the wall had finally given away so that there was an opening 0.5 by 1 cm. in the side of the vessel. Had not help been instantly at hand, a fatal hemorrhage must have occurred. As it was, nearly a pint of blood escaped. Nothing could be done but to ligate the artery above and below the opening and await results, with the expectation, of course, that it would be necessary to amputate the leg.

The entire leg lived, however, and by keeping it encased in cotton to keep it warm, and slightly elevated to facilitate the return venous flow, we found that there was sufficient collateral circulation to sustain its vitality. The wounds healed slowly; the one in the thigh healed in eight months, and the wound of exit in the leg remained as a slow healing ulcer for nearly a year. The patient walked on the leg in about three months. There was no swelling or edema of the leg of any consequence at any time. Thirteen months after the injury the wounds had entirely healed, and there is very little difference in the size of the legs, the injured one being a little smaller.

No pulsation can be felt anywhere in the injured leg. It can be felt at the usual locations in the right. When the blood pressure apparatus is applied to the left leg, with the cuff above the knee, the mercury oscillates at 110 and 70; no sound is heard over the popliteal space or anywhere below. The cuff applied below the knee gives the same effect. Collateral circulation is well established, and the leg approaches nearly normal function.

The femoral vein was apparently not injured, and this is no doubt a factor in saving the leg by favoring the return circulation. The first hemorrhage was evidently due to the giving way of a branch of the femoral artery, since the bleeding point was easily caught and controlled by ligature. The second hemorrhage came through an opening so large in the softened wall of the artery that closure was not to be thought of.

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SATURDAY, OCTOBER 7, 1922

FUNCTIONS OF GALLBLADDER

The fact that some species of higher animals exist normally without a gallbladder, and the repeated observation that persons whose gallbladders have been removed may live in apparent health and comfort for many years, should not be interpreted to indicate that the gallbladder is utterly devoid of any physiologic purpose. Despite the large amount of research devoted to the biliary passages, the output of definite information has been small, and current knowledge of the functions of the bile itself far from satisfactory. There is no doubt any longer, however, that the bile has an important part in the normal processes of digestion and absorption in the intestinal canal; to what extent it may be regarded as an excretory product, as well as a secretion useful in alimentation, remains to be ascertained. One physiologist [1] has contrasted the factors referred to by pointing out that as an excretion the production of bile should be continuous and related, not to the processes of digestion but to the metabolic changes for which it removes certain waste products. On the other hand, bile as a digestive fluid is needed in the intestine only while digestion is going on. The exigencies of the body, he argues, therefore require a continuous excretion of bile by the liver, but a discontinuous entry of this fluid into the lumen of the bowel. This discontinuity is secured in the majority of species by the existence of a gallbladder, a diverticulum from the biliary ducts in which bile can be stored.

How the storage of bile can be further facilitated has been emphasized by recent studies of Rous and McMaster.[2] Water is readily abstracted from bile in the gallbladder so that the bulk of this fluid can be greatly reduced. The "stasis" bile is subsequently diluted by a watery secretion from the ducts as the inspissated product passes through them. These facts help to explain how a reservoir so small that it cannot contain more than a minor fraction of the bile secreted in the daily routine nevertheless serves a useful purpose.

An added use of the gallbladder has been emphasized by Jacobson and Gydesen.[3] Pointing out the lack of inherent propulsive power in the gallbladder, they believe that this organ is mechanically placed as a distensible pouch or bag interposed in a system of biliary tubes for the purpose of minimizing extremes of pressure within that system, as when bile comes too rapidly from the liver or when its passage into the duodenum is prevented by the sphincter of Oddi. It is doubtful whether, under normal conditions, the intraductal or gallbladder pressure ever exceeds 350 mm. of water, the pressure required for obstructive symptoms. Forced movements of the abdominal muscles, diaphragm and contiguous organs produced by excessive respiratory movements, struggling, vomiting and violent peristalsis, Jacobson and Gydesen add, all undoubtedly produce fluctuations in pressure that are equalized by the gallbladder.

IS PARENTAGE DETERMINABLE BY BLOOD TESTS?

Study of the reactions of the body to microbes, microbic products and other protein materials has given us several tests of great value. Agglutination, complement fixation, opsonification, the allergic phenomena and serum precipitation have all been put to practical use in more or less simple tests, some of which are in daily use in modern medical practice. In the case of blood and also certain other protein substances, the most practical method of identification is the precipitin test, which is used generally to determine the nature of blood stains for medicolegal purposes. This test rests on the fact that when a suitable animal, and that means usually the rabbit, is injected with the blood proteins of a different species, its serum forms a precipitate on contact with such proteins. In the course of the immunization, newly formed substances accumulate in the blood, and the action of these precipitins is limited to proteins of the same kind as those that were injected.

The ease with which human blood is identified by virtue of the species specificness of the precipitin test soon led to the thought that, haply, different human races and even individuals might be distinguishable by means of special precipitin reactions; but so far no progress in that direction is recorded, and the idea occasionally expressed that on account of its discriminating delicacy the precipitin test should be of value in the determination of questions of parentage has no foundation. Whether antigenic substances do exist that are peculiar to individuals and their offspring is a problem for the future; at present, certain hereditary characteristics seem to offer the better field for the study of parental identity.

The fact that the grouping of persons by isoagglutination—now become generally known since its

1. Starling, E. H.: Human Physiology, Philadelphia, Lea and Febiger, 1915, p. 714.

2. Rous, Peyton, and McMaster, P. D.: Concentrating Activity of the Gallbladder, J. Exper. Med. 34: 47 (July) 1921; Physiological Causes for the Varied Character of Stasis Bile, J. Exper. Med. 34: 75 (July) 1921.

3. Jacobson, Conrad, and Gydesen, Carl: The Function of the Gallbladder in Biliary Flow, Arch. Surg. 5: 374 (Sept.) 1922.

importance in blood transfusion was stated[1]—appears to be hereditary in nature[2] has led Ottenberg[3] to advocate its use as a means of determining parentage. Without attempting to enter into details, the main point in Ottenberg's conclusion from studying 603 persons in 139 families is that if a child's blood group is in harmony with the blood grouping of the alleged parents, it may be their child; on the contrary, if the child's blood does not group itself in harmony with the parental groupings, it must have a parent other than one of those claimed. We see that, at best, the methods obviously would have marked limitations in practice, and that its results in a given case would fall far short of direct identification of any individual as the parent. And Buchanan[4] regards Ottenberg's criteria as unsafe, even if the grouping could be carried back for three generations, because of the possibility that the heterozygous status of a parent might result in the appearance in the offspring of an unexpected, yet legitimate, blood group. Evidently the last word has not been said as to the reliability of Ottenberg's method; and further observations will be necessary to bring it out of the realm of controversy. The conclusion is that at present science knows of no blood test by which parentage can be determined.

PREVENTABLE DISEASE AND MAP-CHANGING MEDICINE

When huge armies were throwing every ounce of their energies against the opposing line, it was constantly realized that the spread of epidemic disease might mean defeat for the affected side. Preventive medicine, in thus being called on to keep every possible man at the front, came into unusual prominence. Foci of contagion existed in various parts of the globe, and the intermingling of peoples, and the crossing and recrossing of seas, invited contagion to spread; but with one exception, the major demons were kept confined to regions in which they commonly prevail in endemic form. With the World War ended, the sanitary organization was largely dismantled; but the urge for conservation of life and energy did not stop and is still going on. From an examination of developments in the world-wide warfare on disease now being waged by various institutions and agencies, Showalter, in an illustrated article in the *National Geographic Magazine* (September), predicts three announcements of almost unprecedented importance to mankind at no distant date: that (1) yellow fever has been banished from the face of the earth; (2) hookworm disease can be driven from any community which has the will to get rid of it, and (3) malaria can be eradicated from almost any community having enough vital force left to push a thorough yet inexpensive campaign for its extirpation. The widespread incidence of hookworm disease is revealed when it is known that three out of five persons examined in China, three out of four in Siam, and five out of eight in various parts of India are so afflicted. Similar conditions prevail in Brazil, Colombia, Central America, the West Indies and elsewhere. How successful a campaign against this disease may be was shown in Richmond County, Va., where the world-wide fight against hookworm had its inception. About thirteen years ago, when the eradication work began, 82 per cent. of the people of Richmond County had this disease. A survey a few years later showed that only 35 per cent. had the disease; a more recent survey reduced it to 2 per cent., and in 1922 there is apparently not a single person in the county with symptoms of hookworm disease.

Malaria, which, it has been claimed, was largely responsible for the passing of the "glory that was Greece and the grandeur that was Rome," today still lays a heavy hand on millions of people who dwell where it prevails; and yet it costs only one-fourth as much to eradicate the disease as to permit it to prevail. Simple drainage, filling pits and shallow pools, channeling streams, clearing the margins of streams and ponds, removing obstructions, turning in the sunlight, oiling, using top minnows, and quinin are the measures which, when applied with a will, produce astonishing results in malaria-infested regions. With these weapons, malaria was virtually driven from fifty-two towns in ten Southern states at an average cost of 78 cents per capita. Similar measures have been successful against yellow fever, and few foci of that disease now exist.

Sanitary science thus offers hope for freedom from three plagues of man. The plans of campaign for still broader work are well mapped out. They await the officers who will direct the forces in the fight. The number of public health leaders is inadequate now, and calls for trained sanitarians keep coming from all parts of the world. To meet this demand, eleven American universities, and schools in Canada, South America and Europe have established courses in public health and hygiene. Some few years must elapse before the effect of this training will be fully appreciated, but the forces are mobilizing now for the final, successful campaign against several transmissible diseases.

1. Hektoen, Ludvig: Iso-Agglutination of Human Corpuscles with Respect to Demonstration of Opsonic Index and to Transfusion of Blood, J. A. M. A. **48**:1739 (May 25) 1907.
2. Von Dungern, E., and Hirschfeld, D. L.: Ueber Vererbung gruppenspecifischer Strukturen des Blutes, Ztschr. f. Immunitätsforsch. u. exper. Therap. **8**:284-292, 1910.
3. Ottenberg, Reuben: Medicolegal Application of Human Blood Grouping, J. A. M. A. **77**:683 (Aug. 27) 1921; **78**:873 (March 25) 1922; Hereditary Blood Qualities: Medicolegal Application of Human Blood Grouping, J. Immunol. **6**:363 (Sept.) 1921.
4. Buchanan, J. A.: Medicolegal Application of the Blood Group, J. A. M. A. **78**:89 (Jan. 14) 1922; **79**:180 (July 15) 1922.

A Physician's Function.—My function as a physician is not discharged when I say to a solicitous client, "There is nothing the matter with you," unless that opinion is fully accepted. And if my patient continues to believe there is something the matter with him, there *is* something the matter with him, and my function has not been fulfilled until I have made him see, as I see, that he is not in jeopardy.—(Favill, Henry B., The Public and the Medical Profession, A Square Deal, *Penn. M. J.*, November, 1915.)

Current Comment

THE "ALKALINE TIDE" IN URINE

It has long been known that after ingestion of a liberal meal the urine, ordinarily acid in reaction, may become alkaline. Not infrequently, this change is sufficiently pronounced to lead to the deposition of phosphates in the fluid secreted by the kidneys at such times. The phenomenon is commonly designated as the "alkaline tide" in urinary secretion; and more than one physician has been deceived in his interpretation of the presence of protein in the urine because of the flocculent precipitate of phosphates that is readily secured by heating a specimen collected after a meal and showing an approximately neutral reaction. The fact that many foods, notably certain fruits and vegetables, are now recognized to be potentially basic, so that they may lead to a reduction of the acidity of the urine,[1] has raised the question as to whether such factors may not help to explain the "alkaline tide" in many instances. The customary interpretation has been that the secretion of acid into the stomach after meals tends to leave a preponderance of bases in the blood which are quickly disposed of by the kidneys in the interest of neutrality regulation. This hypothesis has lately been substantiated by Hubbard and Munford [2] through a comparison of the alkaline tide in urine with the results of fractional gastric analysis. Those cases which showed free hydrochloric acid in the stomach showed the "alkaline tide" in the morning, and usually in the afternoon as well, while the cases which did not show hydrochloric acid almost without exception did not show the tide. As the determination of the alkaline tide has furnished a method for checking the findings in the gastric juice, it may be that a consideration of the urinary reaction will be found useful in establishing a possible gastric anacidity when satisfactory analyses of stomach contents cannot be secured.

1. The Potential Reactions of Foods, editorial, J. A. M. A. **79**: 1147 (Sept. 30) 1922.
2. Hubbard, R. S., and Munford, S. A.: A Comparison of the Alkaline Tide in Urine with the Results of Fractional Gastric Analysis, Proc. Soc. Exper. Biol. & Med. **19**: 429 (May) 1922.

VASOCONSTRICTION AND RESISTANCE TO INFECTION

The multiplicity of contacts of the human body with its environment makes it peculiarly liable to attack by invading micro-organisms. The latter are, furthermore, often favored by a variety of conditions which they may meet in the higher organism. Moist mucous surfaces maintained at a constant temperature may facilitate rather than retard bacterial invasion; and, not infrequently, the circulation of the blood and lymph may promote the transfer of the objectionable invaders from one place to another in the body. The personal experience of mankind as well as the empiric observations of physicians for generations has shown that the resistance of the host may be decreased in general by bodily fatigue, exposure to extremes of temperature, poor hygienic surroundings, improper diet, and other less readily interpreted environmental factors. Zinsser [1] has pointed out how difficult it is to analyze the causes underlying such depression of resistance. For instance, he remarks, with fatigue or chilling there may be temporary congestion of mucous surfaces, due to vasomotor influences, which alter the secretions on mucous surfaces, or interfere with the normal mobilization of leukocytes, permitting penetration of bacteria when ordinarily they would have been held back. Our ignorance is nowhere more clearly illustrated than in the fact that we know almost nothing concerning the relation between a thorough chilling and the acquisition of what is spoken of as a common "cold." We can only assume, Zinsser adds, that there is interference in some way with the normal bactericidal and phagocytic mechanisms, making possible the penetration and lodgment of small quantities of bacteria, ordinarily destroyed immediately after entrance or prevented from entering at all. Sollmann and Brody [2] have recently shown the marked influence which even temporary ischemia may have on the local resistance to infection. If two wounds of equal size are produced on the skin of an experimental animal, if both are then subjected to the same sort of bacterial contact, and if one region is rendered anemic by local injections of epinephrin, marked differences in the healing process may arise. The ischemic spot will usually show retarded recovery and more marked infective reactions in contrast with the untreated areas. Sollmann and Brody therefore wisely warn against the indiscriminate local use of epinephrin in wounds and especially in catarrhs. Their demonstration also substantiates the current conception as to the origin of "colds" by increased susceptibility to infection, through the reflex vasoconstriction of "chills."

1. Zinsser, Hans: Infection and Resistance, New York, the Macmillan Company, 1914, p. 59.
2. Sollmann, Torald, and Brody, J. G.: Influence of Ischemia on Infection, Proc. Soc. Exper. Biol. & Med. **19**: 400 (May 20) 1922.
3. Osborne, T. B., and Mendel, L. B.: Ophthalmia and Diet, J. A. M. A. **78**: 905 (April 2) 1921.
4. Mori, Shinnosuke: Primary Changes in Eyes of Rats which Result from Deficiency of Fat-Soluble A in Diet, J. A. M. A. **79**: 197 (July 15) 1922.

THE PATHOLOGY OF EXPERIMENTAL XEROPHTHALMIA

The association of certain types of eye disease with dietary deficiencies, to which attention has been directed by the more recent experimental studies in nutrition,[3] deserves the careful consideration of ophthalmologists. To what extent the phenomena recorded for the laboratory animals are also represented in the clinic of human disorders remains to be ascertained. The most conspicuous instance is the eye malady often observed to arise in young rats living on a diet poor in vitamin A. The diversity of names, such as ophthalmia, keratomalacia and xerophthalmia, applied to the manifestations is of itself an indication of the uncertainty or ignorance which exists with respect to the pathologic changes in such conditions. It is generally assumed that the lesions have their origin in the cornea, which, in the advanced stages of the condition, becomes markedly affected. The end-result is, indeed, a keratitis. Thus, Mori [4] has drawn a picture which is similar to that in certain cases in human beings, and is the result of the drying of the epithelium of the cornea.

Often in the course of the disease, he states, the rats' eyes show ulcers which perforate. But Yudkin and Lambert [5] have recently come to the conclusion that it is the eyelid rather than the cornea that is primarily affected. In all cases examined by them there were early focal lesions in the epithelial lining of the lids. The changes consisted of localized foci of degeneration of the epidermis with cellular infiltration, which, in some cases, extended into the subepidermal tissue. In all these early cases the cornea was uninvolved; that is, there were no degenerative changes that could be recognized, and no cellular or vascular reaction. A further novel finding of the same investigators [6] concerns the degenerative or inflammatory changes observed in the lacrimal glands of rats showing evidence of a lack of vitamin A. To what extent these manifestations are connected with or may be responsible for the xerosis remains to be seen. Heretofore the lacrimal glands have received scant attention in the experimental studies of ophthalmia. It will be interesting to learn the outcome of further investigations in this direction.

THE SALIVA OF INFANTS

It is obvious that digestion cannot be satisfactory in early infancy until the essential alimentary secretory functions become properly established. Not many years ago it was often stated that the amylolytic capacities of the infant are not completely developed at birth, and the allegation was used as an argument against the early feeding of any dietary component, such as cereals or cereal decoctions, which contain starch. As an indication of current opinion, one of the most recent textbooks [7] may be quoted. It states that only the parotid of the new-born contains amylase, whereas the submaxillary lacks this enzyme. It appears in the submaxillary gland and in the pancreas only at the end of the second month of life. Furthermore, it is alleged that at birth the amylolytic activity of the parotid is little more than that of many other tissues. However, in a recent examination of the saliva of more than eighty infants in London hospitals, Nicory [8] found ptyalin present at least one and one-half months before term, although only in small quantities. The amount of enzyme increases gradually to the age of one year, when the composition of the child's saliva becomes identical with that of the adult. At all ages the quantity of ptyalin present varies with the general condition of the child, being larger in strong than in weak infants. In view of the fact that an amylolytic enzyme is present in the saliva of babies in appreciable quantities, and that a number of infants fed on milk plus starchy foods manage to utilize a large quantity of the starch, Nicory argues that diastase is present in the pancreatic secretion of infants. In any event, the amylolytic equipment of the baby in early life is not, as a rule, so deficient as has frequently been taught.

5. Yudkin, A. M., and Lambert, R. A.: Location of the Earliest Changes in Experimental Xerophthalmia of Rats, Proc. Soc. Exper. Biol. & Med. **19**: 375 (May) 1922.
6. Yudkin, A. M., and Lambert, R. A.: Lesions in the Lacrimal Glands of Rats in Experimental Xerophthalmia, Proc. Soc. Exper. Biol. & Med. **19**: 376 (May) 1922.
7. Mathews, A. P.: Physiological Chemistry, New York, William Wood & Co., 1920, p. 334.
8. Nicory, C.: Salivary Secretion in Infants, Biochem. J. **16**: 387, 1922.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

State Medical Meeting.—The next annual convention of the Medical Society of the State of California will be held, June 21-23, in San Francisco, immediately preceding the annual session of the American Medical Association. Dr. Henry G. Brainerd, Los Angeles, will preside.

Fund for University.—A campaign is being conducted to raise $10,000,000 for the University of Southern California, Los Angeles. Plans provide for a large medical school and teaching hospital which will cost, on completion, approximately $3,500,000. A meeting of the university officials will be held in the near future, when the staff will be selected and the policy of the medical unit determined.

Hospital News.—It is reported that the Enloe Hospital at Chico has been temporarily closed following the sudden resignation of the three head nurses. A new staff of nurses will be engaged as soon as possible and until then physicians of the community are cooperating to keep the hospital in operation.——The Presbyterian Orphanage at San Anselmo was burned to the ground recently. The superintendent of the institution announced that the new organization will consist of cottage units.——Dr. W. C. Shipley has purchased property adjoining his hospital at Cloverdale and will shortly erect the first unit of a new and modern hospital building.——A hospital to be known as the Hermosa-Redondo Hospital will be erected in Hermosa shortly at a cost of $50,000.

COLORADO

Personal.—Dr. Josiah N. Hall, professor of medicine at the University of Colorado, gave an address before the San Diego (Calif.) Medical Society, September 10.

New County Health Unit.—The Trinidad district of the Colorado Tuberculosis Association organized, September 11, in Las Animas County. Dr. Ben Beshoar was named a director of the Las Animas County Health Association.

CONNECTICUT

Yale University News.—Dr. August Krogh, professor of zoophysiology in Copenhagen University, and winner of the Nobel prize in medicine in 1920, will deliver the Silliman lectures at Yale University, New Haven, October 5, 6, 7, 10, 11 and 12. Professor Krogh has taken, as his general topic, "The Anatomy and Physiology of Capillaries." Dr. Krogh made two trips to Greenland, the first to study the tension of carbon dioxid in ocean water and the second, to investigate the respiratory metabolism of the Eskimos.——At the corporation meeting, a letter was presented from Dr. Lawrason Brown, president of the National Tuberculosis Association, in which appreciation was expressed of the work of Prof. Treat B. Johnson and Elmer B. Brown, who have been associated with Esmond R. Long, Ph.D., of the University of Chicago, in research in the fundamental nutrition of the tubercle bacillus. The corporation passed a vote of thanks to the National Tuberculosis Association for its further appropriation for the work, in which Professor Johnson and Mr. Brown will continue to be associated.——The new four-story medical building, to be known as the Sterling Hall of Medicine, will be erected for Yale University at Cedar and Broad streets, New Haven, at a cost of $800,000. This institution will be built from the Sterling fund.——The Kent chemical laboratory will be used for other purposes when the Sterling laboratory is in use, but no decision has yet been reached as to the purposes to which the Sheffield chemical laboratory will be devoted. During the summer, rapid progress has been made on the construction of the Sterling chemical laboratory, on Prospect Street.

DISTRICT OF COLUMBIA

Physicians Plan Cancer Drive.—Forty physicians of Washington held a meeting in the medical society building, September 27, to outline plans for the campaign of education for

the control of cancer, which will be conducted in Washington, culminating in "Cancer Week."

Lecture on Botulism.—K. F. Meyer, D.V.M., of the University of California, delivered an address on "Botulism" before a joint meeting of the Academy of Science, the medical society and the Society of Bacteriology, in Washington, September 20. The address was discussed by Charles Thom of the microbiologic laboratory of the Department of Agriculture; Dr. R. Eugene Dyer and Ida A. Gengston of the hygienic laboratory, U. S. Public Health Service, and Dr. Jacob C. Geiger, Chicago, epidemiologist of the U. S. Public Health Service.

FLORIDA

Personal.—Dr. George A. Dame, head of the bureau of communicable diseases of the state board of health, has resigned from that position, effective, October 1. His successor has not yet been named.

GEORGIA

Personal.—Dr. Jarret W. Palmer, Aidley, has been reappointed for four more years as a member of the state board of medical examiners by Governor Hardwick. Dr. Palmer was formerly president of the board.——Dr. Victor H. Bassett, for thirteen years city bacteriologist of Savannah, has resigned.

Open Air Schools Planned.—An open air school for children whose health might be impaired in indoor classrooms will be established in Atlanta, the school superintendent announces. This school will be part of the public school system. The young women of the Junior League have offered a substantial sum toward the erection and maintenance of the school.

ILLINOIS

Dr. Furstman's Successor Appointed.—Dr. Harold B. Wood, county health director of Dodge County, Kansas, has been appointed director of public health for the city of Bloomington, to succeed Dr. J. M. Furstman, who resigned some time ago.

Library for Medical Society.—At a meeting of the Peoria Medical Society, September 15, the establishment of a medical library was approved. The entire library of the late Dr. Charles W. Miller was given to the society by his widow, recently, and there have been several donations of medical books. The public library has offered a room for the use of the medical society. Drs. Jay H. Bacon, Rolland L. Green, Sumner M. Miller, Charles D. Thomas and Oliver J. Roskoten were appointed to supervise the new library.

New Board of Medical Examiners.—Dr. Malcolm L. Harris, Chicago, president of the Illinois Hospital Association; Dr. Gilbert Fitzpatrick and Dr. Arthur H. Geiger, Chicago; Dr. Lewis C. Taylor, Springfield, and Dr. Wilbur H. Gilmore, Benton, have been appointed members of the new state board of medical examiners by Addison M. Shelton, director of the state board of registration and education. Dr. Taylor and Dr. Fitzpatrick, formerly members of the board, were ousted during the Miller administration. These appointments are the first to be made by Mr. Shelton. The new director has also announced that he intends to revoke a number of licenses granted under the W. H. H. Miller régime to pharmacists and physicians. Licenses to be revoked will be those brought under fire at the grand jury investigation in Chicago, which resulted in the indictment of Miller on charges of selling examination questions to prospective applicants for various state licenses. Announcement was made that many valuable state records have been taken from the files in the department which would have an important bearing on the criminal proceedings against Miller in Chicago.

Personal.—Dr. Albert M. Earel, Hoopeston, suffered a fractured hip when he fell from a pear tree, September 15. The roentgen-ray examination indicated that Dr. Earel had suffered an intracapsular fracture of the right fibula.——Clarence H. Boswell, Rockford, has been reappointed county physician by the board of supervisors.——Dr. Harris J. Kaye, Waukegan, has returned to America after two months in Europe.——Dr. Darwin M. Keith, Rockford, has returned form Europe, where he attended the International Otology Congress.——Dr. Wilmot L. Ransom, Rockford, returned, September 19, from a tour of Europe.——Dr. John G. Henson, Wyoming, was injured in a motor accident, September 19. He sustained several serious lacerations of the head and of the right leg.

Public Health News.—The antimalaria mosquito campaign launched by the Lions' Club at Carbondale, which is being carried on under the supervision of a sanitary engineer from the state department of public health, is achieving desired results. The work of draining the swamp lands north of the city by the Illinois Central Railroad at a cost of $8,000 is nearing completion.——Dr. Edith Lowry Lambert, St. Charles, has been conducting a summer camp for girls ranging from 3 to 14 years of age. Weekly weighing of all girls in the camp and health lessons were among the features of the vacation. Dr. Lambert has given her time for many years to hygiene for children.——A total of 153 deaths in four years is the toll of tuberculosis in DuPage County, according to figures compiled by the DuPage County Tuberculosis Association.——In response to complaints from officials in Galva and Galesburg, a sanitary engineer from the state department of health is investigating the methods of sewage disposal in those cities.

Chicago

Bogus Physician Sentenced.—It is reported that Ludwig Augustinus of Chicago was sentenced to serve one year in the house of correction and to pay a fine of $1 on each of three charges of practicing medicine without a license, the sentences to run concurrently. He was also held to the grand jury on six charges for operating a confidence game. It was stated that he had obtained money from church members for Boy Scout activities which never developed.

Personal.—Dr. Herman L. Kretschmer gave an address before a joint meeting of the Wabash and Miami County Medical societies at Lafontaine, Ind., September 7.——Dr. Hugh A. Beam, Moline, recently underwent an operation at the Wesley Memorial Hospital, Chicago.——Dr. W. A. Evans gave a lecture at the annual meeting of the Indiana State Medical Association, September 28, in Indianapolis. The lecture was broadcasted by radio.——Dr. Robert H. Babcock delivered a lecture on "The Heart—Patients, Symptoms, Examination, Diagnosis, Treatment and Prognosis," before the Summitt County Medical Society of Ohio, October 3.

INDIANA

Tuberculosis Campaign.—The Fountain County Tuberculosis Association was recently reorganized with Dr. Charles C. Wert, Covington, as vice president.

Joint Medical Meeting.—The medical societies of Jackson, Bartholomew and Jennings counties held a meeting and banquet at the Hotel Metropole, North Vernon, September 20.

State Health Council.—A temporary organization of the Indiana State Health Council was effected, September 21, at a meeting of representatives of the health agencies and organizations having to do with the conservation of health in the state. Mrs. Edmondson, representing the Parent-Teachers' Association, was named chairman. Dr. Walter J. Clarke, New York, executive secretary of the National Health Council, outlined plans of the national council. Dr. Harry W. McKane represented the stated board of health.

State Medical Meeting.—At the annual meeting of the Indiana State Medical Association, held in Muncie, September 27-29, under the presidency of Dr. William R. Davidson, Evansville, the following officers were elected for the ensuing year: president, Dr. Charles H. Good, Huntingdon; vice presidents, Drs. Wilson T. Lawson, Danville, John H. Reed, Logansport, and Charles S. Bryan, Vincennes, and secretary-treasurer, Dr. Charles N. Combs, Terre Haute (reelected). The next annual session of the association will be held at Terre Haute, Sept. 26-28, 1923.

KANSAS

Joint Meeting.—A joint session of the Kansas Public Health Association, the Kansas State Tuberculosis Association and the Kansas Mental Hygiene Society was held at Wichita, September 19-21.

LOUISIANA

Dengue Fever Attacks Officials.—Mayor Mouton of Lafayette, several members of the police force and Deputy Clark Meaux of the courthouse have all fallen victims to the epidemic of dengue now prevalent in that vicinity.

Personal.—Dr. Rudolph Matas, head of the department of surgery at Tulane University, New Orleans, recently sailed for France where he attended the annual congress of French surgeons in Paris, October 2. Dr. Matas addressed the congress on "The Surgery of Blood Vessels."

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MARYLAND

Physicians Added to Pension Staff.—Three salaried medical officers for the examination of applicants for the classified service of the municipal government of Baltimore are provided for in a new pension ordinance recently approved. The appointments are for a term of six years, the salaries yet to be fixed.

Semiannual Meeting of Faculty.—The semiannual meeting of the Medical and Chirurgical Faculty of Maryland was held, September 29-30, at Cumberland. The convention opened with a dinner given by the Tri-State Physicians' Club (Maryland, Pennsylvania and West Virginia). The general meeting followed, with an address of welcome by Dr. F. G. Cowherd, president of the Allegany-Garrett County Medical Society, responded to by Dr. A. H. Hawkins, president of the Medical and Chirurgical Faculty of Maryland. A meeting of the house of delegates and of the council was held on the morning of the 30th, followed by the scientific session.

Personal.—Dr. H. K. Hu, formerly associate professor of bacteriology at the Chinese government medical college at Peking and physician at the government hospital, and Dr. W. D. Oliveira of Brazil, both members of the International Health Board of the Rockefeller Foundation, are in Hagerstown, studying public health methods in that city. Dr. Oliveira and Dr. Hu are taking graduate courses at Johns Hopkins University, Baltimore.——Dr. Lewellys F. Barker of Johns Hopkins University, Baltimore, spoke on "Making Children Perfect" before the New York Medical Society, recently.——Dr. Bernard M. Berngartt, Baltimore, has returned from Germany.——Dr. Patrick F. Martin, Baltimore, has been selected by the Mount St. Mary's College at Emmitsburg as resident physician at that institution.

MASSACHUSETTS

Personal.—Dr. Irving R. Calkins, Springfield, is on the American team in the international shooting tournament at Milan, Italy.——Dr. Mabel A. Southard and Dr. Mary F. Dekruif, both of Boston, have been appointed physicians to the division of hygiene, to investigate maternal and infant hygiene work in the state.——Dr. Edward H. Trowbridge, chairman of the board of health, Worcester, spoke on "Medical Ethics" before the Franklin District Medical Society at Greenfield, September 12.——Dr. Thomas F. Kenney, director of hygiene of the Worcester public schools, has been appointed medical director of the city of Worcester.

MINNESOTA

Hospital News.—Bids will be asked about November 1 relative to an addition for St. Luke's Hospital, Duluth, which will be erected at an approximate cost of $875,000. Dr. A. K. McRae is superintendent of the institution.——The new six-story wing of St. Mary's Hospital building, Duluth, was opened the last part of August with appropriate ceremonies. This addition gives the hospital a capacity of 400 patients and was erected at a cost of $300,000.

Personal.—Dr. Arthur B. Ancker recently completed his fortieth consecutive year of service as superintendent of the City and County Hospital, St. Paul.——Dr. John A. McCuen, Duluth, at one time mayor of the city, suffered a cerebral hemorrhage, September 1, while spending his vacation at Lake Vermillion. He is at present convalescing at St. Luke's Hospital.——Dr. William J. Eklund has been elected president of the Duluth National Bank to succeed his father, the late Dr. John J. Eklund.

MISSISSIPPI

Ant Fund Oversubscribed.—The Argentine ant campaign fund has been oversubscribed, more than $3,000 having been collected recently. The city of Laurel and Jones County together appropriated $600, which will be used in the spring as a nucleus for the extermination campaign.

Laurel Gets Health Unit.—The International Health Board of the Rockefeller Foundation has chosen Laurel of all the places visited for the establishment of a health unit in the South. Tentative plans for this unit were mentioned in THE JOURNAL, August 19, page 668. Counties in several of the Southern states were inspected with a view to the establishment of the unit. A five-year program will be started at once, with a view to stamping out malaria, and the unit will also serve as a training ground for members of the Rockefeller Foundation, preparatory to service in foreign subtropical fields.

Health Officers' Meeting.—An institute for health officers will be held in Jackson, October 30 to November 2. Efforts are being made to make this institute a joint one between Mississippi and Louisiana, whose health problems are of such similar nature as to make cooperation advisable. The visiting speakers will include Dr. Henry H. Hazen, social disease expert of Washington, D. C.; Dr. William H. Park, bacteriologist for the city of New York; Dr. Leslie L. Lumsden, rural sanitation expert; Dr. Taliaferro Clark, chief of the bureau of child health of the U. S. Public Health Service; Dr. Oscar Dowling, state health officer of Louisiana, and Dr. William A. Evans, Chicago.

MISSOURI

Surgical Clinics a Success.—With a total of 262 patients examined in the two days, the general medical and surgical clinic held in St. Joseph under the auspices of the Buchanan County Medical Society, preceding the meeting of the Missouri Valley Medical Association, ended, September 20.

NEW JERSEY

Physician's License Revoked.—It is reported that at a meeting of the state board of medical examiners, September 5, the license of Dr. George W. Mueller, Newark, to practice medicine and surgery, was revoked. Dr. Mueller was convicted on a charge of performing a criminal abortion.

NORTH CAROLINA

Venereal Disease Clinics in All Counties.—Dr. A. S. Campbell of the state board of health recently assisted in a campaign in Durham, Person, Granville and Vance counties, for the eradication of venereal disease. Clinics were opened in each county for free treatment. Many of the city and county prisoners received treatment through the clinics. The state board of health assisted the county clinics by giving blood tests free to those unable to pay for them.

NEW YORK

Fund Raised for Radium.—The campaign to raise $10,000 for the purchase of radium for Middletown has been successful. The Radium Society of Middletown has been formed, with Dr. J. B. Hulett, president, and Dr. Lillian Morgans, secretary-treasurer. After the election of officers Dr. Morgans, who personally gave $1,000 to the fund, presented 90 mg. of radium to the society. Any person who receives radium treatment from the society and who is financially able to contribute to the society for the purchase of additional radium insurance and equipment may do so. Dr. Redfield, a practicing physician, expert in the use of radium, will dispense the radium. Any practicing physician may have the use of the radium on application to the dispenser. Any person suffering from cancer or other disease requiring radium treatment, and who is unable to pay for it, may apply to the Radium Society for treatment.

Child Hygiene Campaign.—A child health campaign, with the slogan "Keep the babies well," is being conducted by the division of maternity, infancy and child hygiene of the state department of health. The enactment last March of the Davenport-Moore law, in accordance with the policy outlined by Governor Miller, has made it possible for the New York State Department of Health to double the forces of physicians and nurses attached to the health mobile unit and thus to double the number of children examined daily at the field consultations which are being held throughout the state in cooperation with local physicians. The results of the examination of infants and children at these consultations are reported to the family physician and the local public health nurse, so that parents may be properly advised as to the best measures to protect the health of their children.

New York City

Hospital News.—The 1,200 members of the Spanish Society, New York, are planning to erect a hospital for the 40,000 residents of the city and state who are of Spanish extraction. A movement to collect $200,000 for this purpose is under way, of which there has been already donated $12,000.——The contract has been awarded for an addition and alterations at the Lawrence Hospital, the Bronx.

A New Division in the Department of Health.—At a meeting of the board of health, August 10, a resolution was passed creating a new division of the department of health, to be known as the division of veterinary inspection. This division is charged with the duties of investigation and enforcement

of all veterinary activities coming within the provisions of the Sanitary Code. It is to report directly and be responsible to the deputy commissioner and the sanitary superintendent. All veterinarians attached to other bureaus have been transferred to the division of veterinary inspection.

OHIO

Hanna Lecture.—Dr. Henry H. Dale, English scientist, director of the National Institute for Medical Research, London, gave a Hanna lecture at the Medical Library Auditorium, Cleveland, October 6.

OKLAHOMA

Hospital News.—The new municipal hospital at Cushing was opened, October 1. A drive is being conducted to purchase equipment and supplies for the institution.——The contract has been awarded for the erection of the $40,000 ward building for the General Oklahoma State Hospital, Norman. ——The Bristow General Hospital, Bristow, has been purchased by Mrs. Bertha Shearin of Memphis, Tenn., who contemplates alterations and additions.

PENNSYLVANIA

Buys Hospital Site.—County commissioners have purchased a 40-acre site in Nether Providence Township, near Pine Ridge Station, for the erection of a hospital for the care of tuberculous patients. The property is splendidly situated for transportation facilities, being located along the Baltimore Pike and also having a front on Wallingford Road and the Plush Mill Road. Work on the building may be started early this winter. According to the county commissioners, the building will cost approximately $100,000 and have fifty beds.

State Hospitals Cut Free Patient Lists.—The state hospitals in Pottsville have begun rigidly enforcing the rule that all patients must pay for their care, and hereafter politicians' recommendations will not clear a patient of his duty of paying his way if it can be shown that he has any property or has any money in bank. Reports forwarded to Harrisburg, September 17, show that free lists have been greatly cut or almost entirely abolished among the patients as the result of the insistence of the Harrisburg officials that this shall be done.

Philadelphia

Heart Disease in Children.—Ten clinics for prevention of heart disease among children have been established in congested sections of the city by the health department of Philadelphia. The work will be conducted by physicians of the division of child hygiene under the direction of Health Director Furbush. Children who, having suffered from contagious diseases, are susceptible to heart trouble will be examined, and an educational campaign among schoolchildren and their parents will also be conducted.

Personal.—Dr. Alphonso N. Codd arrived in New York, September 3, from Europe.——Dr. Samuel Z. Shope is suffering from a fractured rib and bruises sustained in an automobile accident, September 14.——Dr. George D. Fussell has resigned as pathologist to the Misericordia Hospital and the Memorial Hospital of Philadelphia, to become pathologist to the Clearfield Hospital, Clearfield.——Dr. David Wright Wilson, who recently resigned as associate professor of physiologic chemistry at Johns Hopkins Medical School, Baltimore, has become head of the department of physiologic chemistry at the University of Pennsylvania.——Dr. Brooke M. Anspach, professor of gynecology, Jefferson Medical College, addressed the opening of the ninety-eighth annual session of the college, September 25, on the subject of "The Prospect of a Medical Career."

SOUTH DAKOTA

Physician Receives Decoration.—Dr. Oscar R. Wright, Huron, who served with the French Army Medical Corps during the World War, has received a distinguished service order from the French government, for services rendered while with the French Base Hospital No. 32. Dr. Wright received the decoration at the hands of General Pershing, September 29.

TENNESSEE

Physician Convicted.—Dr. George C. Paschall, Arrington, charged with killing his bride of three months, was found guilty of murder in the second degree, it is reported, the verdict carrying a term of from ten to twenty years. Dr. Paschall asked for a new trial and was allowed to go free under $25,000 bond.

TEXAS

Fund for Health Work.—The Young Men's Business League of Beaumont adopted a motion, September 20, to recommend to the various civic organizations of the city that they raise $1,000, required to continue Jefferson County's public health work until the new county commission comes into office.

Hospital News.—Construction work on the first of the five $150,000 units of the new Methodist Episcopal Hospital, Houston, started in August. The first unit will be a five-story structure with accommodations for 100 patients.——An eye, ear, nose and throat hospital will be erected at Temple by Dr. J. M. Woodson of that city. It will be a two-story, fireproof structure.——A new $50,000 hospital will be established at Harlingen by the Baptists there.

VIRGINIA

Physician Wins Verdict.—Judgment for the defendant, Dr. William Harmon Evans, Lynchburg, was entered, September 21, in the Tweedy vs. Evans case. The suit was brought several years ago for $10,000 damages for alleged malpractice. Two trials resulted in hung juries and at the third a verdict of 1 cent for the plaintiff was returned. This verdict was set aside by Judge Barksdale, thereby putting the court costs of the suit and of the three trials on the plaintiff.

Personal.—Dr. Marshall W. Sinclair, Newport News, following a graduate course at Johns Hopkins Hospital, Baltimore, has been appointed pathologist at the Anderson (S. C.) County Hospital.——Dr. Susan A. Price, physician at Eastern State Hospital, Williamsburg, has resigned and accepted the position as physician at Weston State Hospital, Weston, W. Va.——Dr. Charles P. M. Sheffey, Norfolk, sailed from New York in August for the Congo where he will work as a medical missionary. Dr. Sheffey is a graduate of Johns Hopkins University.——Dr. Joseph N. Barney has been reappointed city health officer of Fredericksburg.——Dr. Achille Murat Willis, Richmond, has been appointed professor of surgery at the Medical College of Virginia, to succeed Dr. Stuart McGuire, resigned.——At the annual meeting, Dr. John B. Stone, Churchville, was elected president of the Augusta County Medical Association.——Dr. Ward H. Cook, professor of pathology in the Medical College of Virginia, and Dr. Walter B. Cannon, professor of physiology at Harvard University, Boston, gave addresses before the Richmond Academy of Medicine and Surgery, September 26.

WASHINGTON

Personal.—Dr. William O'Shea, Spokane, sailed with his bride, August 31, on the Scandinavian-American liner *Heilig Olav* for Copenhagen.. Dr. O'Shea will remain abroad for one year and will make a special study of obstetrics.—Dr. Francis B. West has resigned as health officer of Mount Vernon. Dr. George Shorkley will succeed him.——Dr. Claud H. Weir has returned to Yakima after spending considerable time abroad and making a short stay at his home in New York. Dr. Weir will again take up the practice of medicine in Yakima.

WISCONSIN

Traveling Chest Clinic.—More than 5,000 people were examined free of charge by the traveling chest clinic of the Wisconsin Anti-Tuberculosis Association in 1922, according to a report of the first six months' activity, this year. The clinic is not limited to tuberculosis, although discovering early cases is its main object. Since this traveling clinic started, three years ago, more than 16,000 Wisconsin people have been examined, and of this number 18 per cent. were found tuberculous. The state association, with the cooperation of local public health nurses, follows up all the clinic cases.

CANADA

Medical Meeting.—The first general session of the Western Ontario Academy of Medicine was held in London, Ont., September 20, under the presidency of Dr. Charles A. Harris. Dr. William Edward Gallie, University of Toronto, spoke on "The Use of Living Sutures in Operative Surgery," and Dr. William F. Banting on "Pancreatic Extracts in the Treatment of Diabetes."

Personal.—Dr. David Donald has been appointed school medical officer for Victoria. Dr. Donald was a colonel in the R. A. M. C. during the World War.——Dr. Henri Beland, minister of health for Canada, and Dr. William C. Arnold,

director of medical services of the Department of Soldiers' Civil Reestablishment, were entertained to luncheon by the Vancouver Medical Association, August 3, on the occasion of their visit to that city.——Dr. Louis J. Hirschman, professor of proctology, Detroit, held a clinic at the Vancouver General Hospital, recently.——Dr. Robert H. Millwee, Dallas, Texas, spoke on "Deep Roentgen Therapy" before the Vancouver Medical Association, recently.——Dr. Osborne Morris, Vernon, B. C., was recently elected president of the Okanagan Medical Society.

PHILIPPINE ISLANDS

One Million Dollars for Lepers.—The Supreme Lodge, Knights of Pythias, has donated $1,000,000 for the lepers on Culion Island, it is announced from Manila. This money is to be used for the following purposes: 1. Permanent living quarters to be known as "Stevens Memorial Hall" for all white lepers at the colony. 2. Erection of an experimental laboratory with full equipment to carry on experiments in search of an absolute cure. 3. Establishment of an endowment fund amounting to approximately $900,000, to provide money for carrying on the experimental work and to further the benefit work at the colony among all lepers. These plans were included in the resolutions submitted to the grand lodge which held its sessions in San Francisco in August. The amount represents an assessment of $1 on every member of the lodge, which has a membership of nearly 1,000,000 men.

GENERAL

Annual Meeting of Oral Surgeons.—The second annual meeting of the American Association of Oral and Plastic Surgeons will be held at the Boston Library, October 20-21. All interested in these special fields of surgery are invited to be present. The secretary is Dr. Henry S. Dunning, New York, and the president, Dr. Truman W. Brophy, Chicago.

American Occupational Therapy Association. — At the annual meeting of the association held in Atlantic City, N. J., recently, Mr. T. B. Kidner was elected president of the association. Dr. G. Canby Robinson, Baltimore, was elected vice president, and Mrs. Elenor Clark Slagle, secretary-treasurer. Dr. William R. Dunton, Jr., Baltimore, is chairman of the committee on publicity and publications.

Health Survey of Printing Trades.—With the cooperation of the U. S. Bureau of Labor Statistics, the International Joint Conference Council of the allied printing industry, representing both employers and employees, has authorized a nation-wide health survey of the printing trades. It is expected to take about two years. It will include every phase of the industry bearing directly or indirectly on health, physique and physical efficiency.

British Commission to Study Milk Conditions.—A health commission, consisting of Ernest A. Evans and A. D. Raymond, representing the London Dairies, Ltd., is visiting this country to study the American milk pasteurization methods. Accompanied by Dr. Royal S. Copeland, the commissioners visited the child health stations in New York. They stated that the American methods were far ahead of those employed in London. The members of the commission will visit Philadelphia, Washington, Baltimore, Chicago and St. Paul.

American Society for the Control of Cancer.—In connection with the annual "Cancer Week," Postmaster-General Work was requested to give his consent for the use of dies on canceling machines in the postoffices of various states, bearing the legened "National Cancer Week, Nov. 12-18." Dr. Work complied with this request and stated that the dies would be engraved at the earliest date possible and forwarded to postmasters at the offices mentioned, who will be instructed to place them in operation immediately on their receipt. Dr. Frank Billings, Chicago, has prepared a letter for special reading in churches, of which 500,000 will be printed.

Personal.—Surg. Richard H. Creel, Asst. Surg.-Gen. John D. Long and Surg. Lewis R. Thompson of the U. S. Public Health Service have been ordered to Norfolk, Va., to investigate methods of fumigation of vessels at quarantine stations in that vicinity.——Dr. B. E. Washburn, former director of the rural sanitation of the board of health of North Carolina, recently visited Charlotte while on furlough. Dr. Washburn has been serving with the International Health Board in Jamaica, engaged in hookworm elimination programs. He will return to Jamaica in January.——Surg. James G. Townsend of the U. S. Public Health Service has been directed to proceed to San Juan, Porto Rico, in connection with the tuberculosis situation on that island.——Dr. Oswald E. Denney, Washington, D. C., sailed, September 16, for Rio de Janeiro, to investigate smallpox, bubonic plague and leprosy. ——Dr. Samuel J. Herman, Detroit, sailed, September 9, for Europe on the *Homeric*.——Dr. Achille Almerini, New York, sailed on the *Conte Rosso* for Italy, September 14.

Commission to study Medical Schools Here.—A delegation of members of the faculty of the University of Strasbourg, Alsace, arrived in New York on the *Paris*, September 30, as guests of the Rockefeller Foundation, for the purpose of studying the organization and methods of American medical schools. The visiting commission is made up of the dean, Dr. Georges Weiss, professor of biophysics; Drs. Léon Blum, professor of clinical medicine; Paul Bouin, professor of histology; Camille Duverger, professor of ophthalmology; Paul Masson, professor of pathologic anatomy; Maurice Nicloux, professor of physiologic chemistry, and Lucine Pautrier, professor of dermatology and head of the cutaneous diseases clinic. After a brief stay in New York, the members of the commission will visit Johns Hopkins Medical School, Baltimore; Harvard Medical School, Boston; University of Pennsylvania, Philadelphia; University of Michigan, Ann Arbor, and Washington University, St. Louis, as well as the hospitals affiliated with these institutions.

LATIN AMERICA

Plague in Mexico.—A death from bubonic plague occurred, September 25, at Salina, Vera Cruz.

New Mexican Society.—A new medical society has been formed in Jalapa, Vera Cruz. Dr. Luis Espinosa was appointed president and Dr. Julio F. Rebolledo, secretary. Meetings will take place weekly.

Vera Cruz State Hospitals.—The Civil Hospital of Jalapa, Vera Cruz, is to be reequipped. At Orizaba, Vera Cruz, a new sanatorium is about to be opened. In Vera Cruz City, a new ward has been added to the Spanish Hospital.

El Salvador Signs Opium Convention.—The *Boletín Sanitario*, the official organ of the national public health service in El Salvador, publishes the details of the international convention in regard to opium; also the decree of the legislature ratifying it for the country. The decree was signed by the governor, May 29, 1922.

Salvador Journals.—The *Archivos del Hospital Rosales* of El Salvador hereafter will be published only semiannually instead of monthly. Papers by the hospital staff will be published in *La Clínica*, the journal recently established in that country. The editors of the *Archivos* and *La Clínica* are Dr. Rafael V. Castro and Joaquin Soto, respectively. *La Clínica* is also the organ of the medical students of El Salvador.

Cuban Medical Fellowship.—The first traveling fellowship granted by the French-Cuban Medical Association "Joaquin Albarrán" was assigned to Dr. Emilio Fiterre, an intern of the Calixto Garcia Hospital. The "Joaquin Albarrán" society was organized during the recent visit of French physicians to Cuba, in order to establish closer relations between the two countries. All fellowships will be for one year, and the studies are to be made in France.

The Argentine Medical Association.—At the recent annual meeting of this association Dr. E. V. Segura was elected president; Dr. Tulio Martini, secretary; Dr. E. Finanza, treasurer; Dr. F. R. Pasman, protreasurer, and Dr. C. A. Castaño, director of publicity. The *Semana Médica* relates that the last year has witnessed the doubling of the membership and the increasing of the scientific production by tenfold, while the leading medical societies of the country have affiliated with the association. It says also that the financial condition could scarcely be healthier or more solid. The *Revista*, published by the association, is always regularly reviewed in the Current Literature Department of THE JOURNAL. The *Revista* is now in its thirty-fifth year.

Prizes Offered.—The Sociedad Médica de Caracas has founded a prize in memory of Dr. E. Ochoa. It is to be awarded this year for the best work on tropical pathology or surgery by a physician of Venezuela. The prize is 500 bolivars and a special certificate. The competing articles must be sent in anonymously.——The prize founded by the will of Dr. J. M. Alvarez is to be the annual income from 10,000 pesos bequeathed to the faculty of medicine of the University of Cordoba for the purpose. It is to be given to the author of the best work on hygiene or affiliated subjects presented as a thesis for the degree. If none is presented, the prize can be given to the medical student who has distinguished himself by his work in hygiene.

Personal.—Dr. Carlos Chagas, director of the public health service in Brazil, has been appointed lieutenant-colonel in the medical reserve force of the Brazilian army.——A banquet was tendered recently to Dr. Larguia of Buenos Aires, on the ocasion of his appointment as medical chief of the Children's Hospital.——Dr. N. M. Caudino of Buenos Aires has completed the course in hygiene at the Paris medical school; his wife, Dr. Maria T. Ferrari, has been studying in the Schickelé clinic at Strasbourg.——Prof. P. Abrami of Paris has been lecturing at Buenos Aires on malaria. He has been associated with Widal in the latter's research on colloidoclasis, anaphylaxis, etc.——The students of the Buenos Aires medical school recently presented a gold tablet to the retiring dean of the medical faculty and his assistant, Prof. J. Méndez, and Prof. H. Dasso. The occasion was their election to membership in the Madrid Academia de Medicina.——The official delegation from Argentina to the Third American Child Welfare Congress at Rio de Janeiro comprised nine of the leading pediatricians of Buenos Aires. ——Dr. José Arce and Dr. Herrera Vegas of the Buenos Aires faculty of medicine have been granted leave of absence for a brief trip to the United States.——Dr. F. Lemaitre of Paris recently spoke on cancer of the larynx at a meeting of the Sociedade de Medicina e Cirurgia of Rio.——Dr. P. Morsaline has been appointed *ad honorem* delegate of the Buenos Aires faculty of medicine to study radium therapy in foreign lands.——Dr. Miguel Couto and Dr. Aloyso de Castro of the chairs of clinical medicine and medical pathology in the Rio faculty of medicine, were recently given an honorary degree by the Buenos Aires faculty of medicine, in tribute to the Brazil centennial celebration.

FOREIGN

Second International Congress on Military Medicine and Pharmacy.—Our Italian exchanges give the details in regard to this congress, which has been appointed for May 28 to June 2, 1923, to meet at Rome. The first congress of the kind was held in July at Brussels. The *Giornale di medicina militare* has been appointed the official journal for the meeting.

Society of Serbian Medical Practitioners.—The fiftieth anniversary of the society was celebrated at the University of Belgrade, September 21. In the morning, there was a session in commemoration of medical men who died in the discharge of their duty during the World War. Visits were paid to various public health institutions in the city and in the evening a banquet was held.

Medical Appointments in Aeronautics.—The undersecretary of state in France, for aeronautics and aerial transportation, has appointed Dr. R. Cruchet as physician in charge of medical examinations in the Bordeaux district, and Dr. Garsaux for the Bourget district. Each of these centers has three or four specialists attached to them, Béhague, Rouget, Aubourg and Cantonnet at Bordeaux, and Moulinier, Portmann and Ginestous at Bourget.

Postgraduate Study in Paris.—The Collège des Etats Unis, Paris, which was founded to promote professional intercourse between the French and Americans, is answering its purpose most admirably, opening up to Americans the wonderful clinical opportunities and material of the Paris hospitals and lectures. We refer to it again as the address of the institution has been changed. It is now 24 rue Caumartin, Paris, and Dr. W. B. S. Richardson is in charge.

Sanitary Investigation in Japan.—In an effort to lower the infant mortality rate, Osaka has employed ten physicians, who will make a thorough investigation of sanitary conditions in that city. Lectures on the care and treatment of infants will be given throughout the city. The birth rate in Osaka is reported to be 100 a day, while the infant death rate is one of the highest in the world. Insanitary homes and the general unhealthiness of the city are said to be the cause of these conditions.

Plague in Australia.—An outbreak of plague which occurred in Sydney has been investigated. Infection was traced to a steamer which arrived from Brisbane on which there had been a fatal case of plague. Six dead rats were found on the ship, and one of these was found to be plague infected, but the others were too putrid for examination. Soon after the arrival of the ship infected rats were caught on the wharf and sixteen cases of plague subsequently developed among the civilian population near the docks.

Jubilee of the Copenhagen Medical Society.—On October 11, this year, the Copenhagen Medicinske Selskab completes its hundred and fiftieth year, and is planning to celebrate the anniversary. A historical pamphlet is being prepared, and there will be a banquet for members, a reception at the city hall and an exhibition of portraits. There is also to be a festival meeting, with a cantata and speeches, and election of honorary foreign members. The president of the society is Dr. Scheel.

World's Student Christian Federation.—The European Student Relief of the Christian Federation has appointed a committee to cooperate with the Universities' Library for Central Europe, coordinating the work of securing, by gifts, exchange and purchase, books, journals, and the like, for students and professors and for libraries in the universities of Central Europe. Donations of books, periodicals and money will be gratefully received by Mr. B. M. Headicar, Universities' Library and Student Relief for Europe, London School of Economics, Houghton Street, London, W. C. 2.

Neurology Congress of the Northland.—The first Inter-Scandinavian assembly of neurologists and psychiatrists was held, August 30-31, at Copenhagen, on the invitation of the Copenhagen Neurologic Society. The Nordiske Neurologiske Forening was founded, and the large attendance and number of papers presented at the congress demonstrated great interest. Epidemic encephalitis was the principal subject discussed, and Antoni and Kling of Sweden, and also Wimmer and Neel of Denmark, illustrated their remarks with moving pictures of the chronic sequelae and also of atypical acute forms of the disease.

Promotion of Race Renewal.—The National Council for the Promotion of Race Renewal, which established the National Birth Rate Commission, is organizing an international congress for the reaffirmation of the world's moral ideal, to be held in London, October 15-22. The Bishop of Southwark will preside. Dr. Mary Scharlieb will speak on "Marriage, Parenthood and the Relation of the Sexes." Prof. William Caldwell of McGill University, Montreal, and Sir Arthur Newsholme will discuss the economic, social and racial aspects of morality and the rise and fall of population, migration, etc. All communications regarding the congress should be addressed to the secretary, Sir James Marchant, 60 Gower Street, London, W. C. 1.

Texas to Finance Medical Station in China.—Following the visit of Dr. Nathaniel Bercovitz, head of the medical station at Kachek on the island of Hainan, China, the City Temple, Dallas, has assumed the financial responsibility of that station. The station will have a staff of ten missionaries carrying on work through the schools, the churches and the hospitals. The hospital which it is planned to erect there will cost $60,000 and will take about six years to complete, owing to the difficulty of obtaining materials. Pledges to the work by the City Temple amounted to $16,650. The station ministers to 750,000 people, and Dr. Bercovitz is the only physician in that district, it is stated. The organization which has been formed to promote the work of the hospital will be known as the Parish Abroad Association.

Fund for Chinese Universities.—The Rockefeller Foundation has given $125,000 each to the Southeastern University at Nanking and Nankai College at Tientsin for science buildings and equipment. Southeastern University is a government institution. Nankai College is in the north, and is a private institution receiving provincial aid. Both furnish examples of what the Chinese are now doing in science, and its application to medical education and programs of public health, financed with Chinese money and with the teaching and management entirely in Chinese hands. Appropriations have heretofore been made to the premedical work of five mission colleges, as well as to a large number of mission hospitals in China. The gifts to Southeastern University and Nankai College are the first for premedical teaching that have been made to institutions under purely Chinese auspices, the foundation states. A special investigation of premedical education in Chinese and foreign colleges in China was made for the Rockefeller Foundation in 1921 by Prof. Paul Monroe of Teachers' College, Columbia University.

Personal.—Dr. H. Cilento of the Australian Health Department recently arrived in America to study the methods used by the late General Gorgas in effecting sanitation in the Canal Zone. After two months, he will go to New Guinea to take charge of the medical administration of the island, now under Australian control.——Dr. Robert Bárány, professor of otolaryngology at the University of Upsala, Sweden, will give a private course of twenty lectures plus operative work, in Los Angeles, beginning, November 20.——Professor

Pirquet expects to come to America this fall to locate, on account of the economic conditions in Austria. As yet he has accepted no position.——Professor Schick of diphtheria test fame has accepted a position with one of the larger hospitals in New York.——Dr. Jean Guisez of Paris sailed, September 20, for London on the *President Monroe*.——Dr. Henry Roy Dean, since 1915, professor of pathology in Manchester University, and recently elected to the new university chair of bacteriology tenable at University College, London, has been appointed professor of pathology at Cambridge University to succeed the late Sir German Sims Woodhead.

Deaths in Other Countries

Sir **Charles Ryall,** senior surgeon of the Cancer Hospital, London; president of the section of proctology of the Royal Society of Medicine; member of the Council of the Royal College of Surgeons of England, suddenly, from angina pectoris, September 5, while on his vacation in Scotland, aged 53.——Dr. **T. Ichikawa,** president of the Momoyama Hospital, Japan, September 19, from typhoid fever, contracted while experimenting with typhoid serum.——Dr. **David Sharp,** entomologist. In 1892 he became editor of the *Zoological Record;* past president of the Entomological Society of London; died, August 27, aged 81.——Dr. **H. Kayser** of Frankfort-on-the-Main, aged 59.——Dr. **A. de Rijk,** chief of the medical service of the leading insurance company in the Netherlands, aged 48.——Dr. **Avelino Martín,** a well known otologist of Barcelona.——The *Vida Nueva* of Havana reports the death of Dr. **A. Frias Oñate.**

CORRECTION

Roentgen-Ray Equipment at Montefiore Hospital.—In THE JOURNAL, September 16, it was stated that this New York hospital had installed a portable roentgen-ray machine of 350,000 voltage. Such apparatus is not portable.

Government Services

Decreasing Number of Officers

Final action on the cases being considered by the elimination board of the army of which Surgeon-General Ireland is a member has been delayed in most instances by a reconsideration of the lists, made necessary by the recent amendment to the law passed by Congress. This amendment has occasioned a large volume of work in a review of hundreds of cases, most of them of officers of the grade of major or captain, who would have been selected for retirement if the law had not been amended but who will now be demoted. Revision of the list of officers for this purpose has been slow and much correspondence and preparation of records are involved. One factor in the situation pertains to the officers that have applied for discharge, with a year's pay. All of them are naturally anxious to know the action that has been taken on their requests and to avail themselves of accrued leave if their requests are granted. The elimination board's policy as to these applications for discharge is that, in most cases, they should be granted on the theory that, regardless of an officer's past record of efficiency and possible usefulness in the future, it is better to permit him to leave the army than to retain him against his wishes. It is recognized also that officers have opportunity for employment in civil life as well as professional careers that they are anxious to enter with the least possible delay.

President Issues Order on Care of Disabled Soldiers

An order has been issued by the President to expedite plans to care for disabled soldiers in government-owned hospitals. The action was taken as a result of a conference held at the White House, attended by Col. A. A. Sprague, Chicago, head of the hospitalization committee of the American Legion; Dr. W. F. Lorenz, Madison, Wis., and Dr. T. W. Salmon, New York, the latter two being specially experienced in the treatment of neuropsychiatrics. Formal complaints were registered against the practice of placing shell-shocked veterans in private institutions, and the President was informed that these patients could get proper treatment only in government-owned and operated hospitals.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 11, 1922.

Deaths from Hydrocyanic Poisoning in Fumigation of a Steamer

Two deaths from hydrocyanic poisoning have occurred during the fumigating of the Atlantic liner *Mauretania.* The shipping companies have asked the ministry of health to appoint experts to inquire into this method of fumigation. Dr. R. J. Reece, senior medical officer of the branch of the ministry which deals with sanitary administration in connection with infectious diseases, and one of his staff have gone to New York to inspect the arrangements there. The use of hydrocyanic acid for fumigation of ships was first adopted in this country last March under the supervision of the port sanitary officer of Liverpool, and was successfully performed without accident in two cases. Previously, sulphur dioxid was used for the destruction of rats and other vermin on ships. It has the disadvantage that it is a heavy gas and lingers for a long time. Moreover, it damages cargo and furniture, and attacks metal. At Liverpool, elaborate precautions were taken against accident. Ropes were attached to door handles, ventilator covers and tarpaulins on the hatches, so that all could be opened from a distance. Further, the health officer asked for certificates from the marine superintendent and the chief of the fumigating staff that every man had been accounted for before fumigation began. The ship was left for two hours under the influence of the gas, and then opened by the staff working from leeward to windward. After that, the assistant port health officer went below, wearing a breathing apparatus and carrying a cage of rats to test the atmosphere in all parts of the ship.

Diphtheria and Antitoxin

The persistent high morbidity and high mortality of diphtheria have led the ministry of health to issue a memorandum on the use of antitoxin. The local health authorities are required to make arrangements for the prompt supply of antitoxin to physicians and to educate public opinion regarding the insidious onset and grave danger of diphtheria. The present memorandum points out that early administration of antitoxin not only reduces the mortality from diphtheria but also causes the disease to run a milder and shorter course. Every physician, as soon as he has diagnosed diphtheria on clinical evidence, should have the patient forthwith removed to an infectious hospital, or should administer an adequate dose of antitoxin.

The Treatment of Dementia Praecox

In its twenty-sixth annual report, the board of the Scottish asylums pathologic scheme states that Dr. Ford Robinson Robertson has continued his important researches into the causation and treatment of dementia praecox. He believes that this frequent and progressive form of insanity is traceable to intestinal toxic processes, and that it can be effectively treated by vaccines in the early stages, before irreparable brain damage has been done.

Steinach's Disciple in London: The Elixir of Life Again

Some time ago (June 18, 1921), the sudden and dramatic death of Mr. Wilson on the night before he was to lecture in London on his rejuvenation by Steinach was described in THE JOURNAL. This brought to an end an attempt which was being made to introduce the operation into this country. But the check was only temporary. A newspaper now states

that Dr. Steinach's treatment is to be brought to London. Dr. Conrad Burkhardi will begin the treatment in New Cavendish Street. So far, the medical press has not noticed the enterprise, and the medical profession has not shown any tendency to follow Steinach. We are also informed that "Dr. Burkhardi practiced in Vienna, where both English and Americans were among his patients. His decision to come to London was prompted by the appeals of his English patients."

The Health of London Children

Dr. Hamer, county health officer and school medical officer for London, has presented a report for 1921 which shows that efficient health administration has brought a better expectation of life and efficiency to the child population of London. The stringent notification of all cases of inflammation in the eyes of infants has reduced the loss of sight due to ophthalmia neonatorum in a remarkable degree. In spite of the high incidence of scarlet fever, which marked the closing months of 1920 and was intensified in 1921, the medical influence in the schools seems to have extended the interval between the periodic "major waves." Seventy years ago, the waves of throat epidemics swelled to their maximum in five or six years. In the last quarter of a century, the interval has been seven or even eight years. Further, the deaths due to them are not one-tenth what they were. Equally noteworthy is the steady improvement since 1913 in the general social and physical condition of London schoolchildren. This was brought about by the high wages and abundant employment during the war. That this artificial prosperity was due to the country living on its capital and must, therefore, be followed by a corresponding depression of wages, the report does not take into account. The percentage of rickets among entrant children fell from 22.6 to 14.1 per cent. Of 217,333 children examined by the school physicians in elementary schools, 85,687 were found to require treatment for one or more defects. Attendances at minor treatment centers reached the vast total of 1,274,613. Ten per cent. more children now leave school with sound teeth than was the case eight years ago. Of the boys, 60.3 per cent. have sound teeth at 12, and of the girls, 63.5 per cent. as against 50 and 52.4 per cent. in 1913.

Honor to American Pioneer of Dental Science

A bronze bust of Green Vardiman Black, founder of the Northwestern University School of Dentistry, Chicago, has been given by the school to the National Dental Hospital, being presented by the American consul-general, Mr. R. P. Skinner, in the absence of the ambassador. Dr. G. E. Maclean, director of the American University Union in Europe, who presided at the ceremony, said that this was the first time that such a presentation had been made from one university to another. Mr. A. Davenport Black, who is visiting Europe in connection with the conference of the American Dental Society in Europe, expressed his pleasure and that of his family at this commemoration of his father's memory in England.

The Treatment of Venereal Disease

Schemes of treatment on the lines laid down by the royal commission of 1916 have now been instituted by 142 local health authorities. The number of treatment centers is 194 (151 in voluntary hospitals, fifteen elsewhere and twenty-eight in special centers). In 120 clinics, there is provision for immediate treatment of gonorrhea. The medical staff of the clinics consists of 384 officers. At most of the hospital clinics some beds are available for inpatients. There are fifteen hostels which can receive 259 female patients; the number treated in 1921 was 770. Nine institutions take in pregnant women suffering from venereal disease, and valuable preventive results have been achieved in ophthalmia neonatorum and infantile syphilis. Difficulty is found in getting patients suffering from venereal disease to attend long enough, but much depends on the personality and efficiency of the medical director and on the adequacy of the premises, especially for the irrigation of gonorrhea. Special premises attached to hospitals have been found best. Most physicians fail to take advantage of the facilities provided at the clinics for the examination of pathologic specimens, and fewer qualify themselves for obtaining a free supply of arsphenamin, or attend with patients for consultation. There is a lack of collaboration between health officers and venereal disease officers. The statistics show a significant reduction in the new cases dealt with in 1921 (roughly, about 20 per cent.), and, on the other hand, persistence in treatment is greater. It is claimed that the clinics are proving centers of enlightenment and education and that the majority of cases of syphilis are rendered temporarily noninfectious. The reduction in new cases appears to be due to this cause. It is also claimed that a substantial proportion of cases of syphilis are cured.

Physicians Warned Off the Navy

The drastic reductions in the navy following the Washington agreement has led to a large number of naval surgeons finding themselves placed on the retired list at 50, when they had anticipated another five years. By the new regulation they are deprived not only of an increased rate of pay but of chances of promotion with increased pension. Officers in other branches of the service have been given compensation for the earlier age of retirement, increases of pension varying from 26 to 100 per cent. But surgeon-commanders are given only 10 per cent. For nearly two years the British Medical Association has been asking the admiralty to redress this grievance, but without result. Finally the council has issued a warning to young physicians as to the risks they run in placing the control of their careers in the hands of the admiralty.

Lead Poisoning from Beer

A considerable number of cases of lead poisoning due to contaminated beer have occurred in the county of Middlesex. A physician noticed that lead poisoning was occurring among his patients, and notified the health officer. The latter found that there was a widespread outbreak in his district, limited to persons using certain saloons in the cellars of which large iron tanks lined with white enamel had recently been installed for storing beer. Samples of the beer were found to contain about 1 grain of lead to the gallon; while the beer as it left the brewery contained none. A lead glaze had been used in the preparation of the enamel and, owing to the solvent power of its sugars, the beer had dissolved some of the lead. The use of the tanks was stopped, and the outbreak ceased. The affected persons had been drinking the beer for two or three weeks before the symptoms appeared. It is thought probable that cases of lead poisoning ascribed to unknown causes have occurred among persons residing in other districts who frequented the saloons in which the contaminated beer was sold. This occurrence shows the value of prompt action on the part of physicians in notifying of cases of illness which may be due to articles of food or drink.

PARIS

(From Our Regular Correspondent)

Sept. 15, 1922.

Identification of Dead Bodies by Means of Dental Records

Dr. Coffart of Paris was able to identify, by means of a dental record, a corpse that had lain buried for seven years (1914-1921) with fifteen other bodies in a common trench. Coffart studied successively the dentition of the bodies. That of the fourth cadaver examined corresponded exactly to the

record on the dental card that he had brought. The extractions and fillings indicated on the card had their counterpart in the corpse. There could be no doubt, and the identification was furthermore confirmed by certain details of the clothing, which the mother of the soldier recognized without hesitation. Dr. Coffart concludes from his experience that denal records constitute a safe and reliable means of identifying dead bodies, provided no extensive traumatism has destroyed the jaws.

A Physiologic Agent for the Detection of Poisons

Claude Bernard, in one of his lectures, after referring to the spontaneous peristaltic movements that are observable in the intestine immediately after death, said: "It is a subject worthy of research in organs that are capable of functioning spontaneously and, to a certain extent, as if they were exempt from nervous control." Dr. S. Icard of Marseilles took up the subject recently, inquiring into the phenomena of life that characterize the tail of certain animals; more especially, the long survival of the tail in the gray lizard and the wall lizard (*Lacerta muralis*). The observations he has made not only possess a purely scientific interest, but also have a practical interest. *Lacerta muralis* is a valuable agent in detecting poisons. As such it can render important service in legal medicine for the determination of toxins, and in experimental medicine for the study of certain drugs.

The results of Icard's researches may be thus summed up: When it is a question of a poison that has a paralyzing effect on the nervous system, he noted that it had an exciting effect on the movements of the tail of the lizard. If he was concerned with a poison that paralyzes the muscular system, he observed no exciting effects on the movements of the tail. In case of a poison exerting a stimulative effect on the nervous system, without anesthesia, there were convulsive and spontaneous movements of the tail, these movements ceasing when the tail was amputated; with anesthesia there are no spontaneous movements of the tail. If one is dealing with a poison that stimulates the muscular system, without anesthesia, there were convulsive and spontaneous movements of the tail, these movements persisting in the amputated tail; with anesthesia, convulsive and spontaneous movements of the tail.

First Application of the New Law Pertaining to Toxic Substances

The new law of July 14, 1922, pertaining to toxic substances (THE JOURNAL, Aug. 12, 1922, p. 569), which imposes on delinquents an obligatory punishment of from five to ten years *interdiction de séjour* (restricted residence), recently found its first application in the correctional court of Paris. A man found with cocain on his person has been found guilty and sentenced to eight months in prison and five years of *interdiction de séjour*.

Rights of Herb Venders

According to French law, herb venders have the right to sell certain simple drugs in common use, such as fresh or dried medicinal plants, a list of which is contained in the codex. But the court of cassation (the highest court of France) has decided that the herb vender commits an illegal act when he places on sale, under the name of a "tea," accompanied by indications of his own fancy, a mixture of plants with nothing to reveal their nature or the proportion of each, and recommends such tea as constituting a sovereign specific in certain maladies.

Revision of the Pension Law

A law has just been promulgated which modifies the law of March 31, 1919, in regard to the medical and surgical care of those ex-service men who have been granted a certain percentage of disability. As already mentioned (THE JOURNAL, April 23, 1921, p. 1183), the law of 1919 brought forth many protests from the medical profession, based chiefly on the fact that the law did not grant the men liberty of choice of a physician or surgeon, and that the ex-service man was compelled to return to the hospital from which he was originally discharged. The new law grants satisfaction to the medical profession in that it recognizes that the beneficiaries shall have the right of free choice of physician, surgeon and pharmacist.

An Appeal of the French Red Cross for Aid to the People of Russia

In previous letters, I mentioned a mission sent out by the French Red Cross to bring aid to the Russion people (THE JOURNAL, April 29, 1922, p. 1327, and July 29, 1922, p. 392). Six million francs had been appropriated, for the purpose, by parliament. Of this sum, five million francs was furnished in kind, and one million francs in cash, with which to defray the general expenses of the enterprise. In addition to these resources, there may be added smaller gifts in kind to the value of from 200,000 to 300,000 francs and about 200,000 francs in smaller cash gifts, 60,000 of which came from seventeen different general councils or departmental assemblies. The mission arrived in Petrograd, July 12, with the main portion of the aid, and the distributions have been carried out normally. There has been no pillage of goods or merchandise by the famished throngs, nor arbitrary diversion of funds by the soviet authorities, and the members of the mission state that they have been able, within the exact limitations of the agreement, to carry out the work entrusted to them. What interferes with the further prosecution of their task, now that they have reached the Ural zone, is that their resources for the handling and transport of stocks are exhausted. There are still stocks of goods to be transported, which should be placed as soon as possible at the disposal of the agents of the committee of the Red Cross, who wish to limit to a strict minimum the duration of their stay, by reason of the great expense that the mission will be put to in completing its formidable task. As the French Red Cross is not entitled to take the money needed for this purpose from the appropriations intended for its work in France, and since too long a time will elapse before parliament reconvenes, an appeal has been made to the general councils of the several departments. With this object in view, General Pau has addressed a letter to the presidents of these assemblies. He requests that they propose to the general councils, at the present session, that they make an additional contribution toward the work entrusted to the executive committee of the French Red Cross, thus following the example of the seventeen departmental assemblies that have already given evidence of their loyalty.

MEXICO CITY

(From Our Regular Correspondent)

Sept. 17, 1922.

Carbon Tetrachlorid and Hookworm Disease

The suggestion made in THE JOURNAL (Nov. 19, 1921, p. 1641) by Hall, as to trying carbon tetrachlorid in the treatment of hookworm disease in man has aroused much interest in this country, where the disease is prevalent. Results confirmatory of Hall's conclusion, namely, that the new remedy is harmless and therapeutically efficient, have already been published by Dr. Garcia Escobar, who tried carbon tetrachlorid in the army hospital at Vera Cruz, and Neftali Rodriguez, who chose this subject for his graduating thesis. Rodriguez' paper includes a report on animal experiments, pathologic studies and clinical trials in hookworm patients.

Personal

Dr. Carlos Govea died last month.——Dr. Rex Duncan, roentgenologist from Los Angeles, has arrived in Mexico, where he is a guest of the secretary of war.——Dr. Rafael Silva, a former pupil of Professor Fuchs, has left for Europe, where he will take some graduate medical courses.——After taking some courses in Germany during the year, Dr. Juan L. Torroella has returned to this country.——Dr. Adrián Correa has assumed charge of the medical department in a newspaper, *El Heraldo de México*. He intends to keep the public posted on the harm caused by quackery.——Dr. Ulises Valdés, former dean of the medical school and former president of the Academy of Medicine, has left for Boston.

BERLIN

(From Our Regular Correspondent)

Sept. 2, 1922.

The Therapeutic Value of Music

The daily press contains a report from New York that a surgeon has recommended the use of music in anesthesia. It is known that music exerts a soothing effect on nervous patients. This was the inspiring motive in the bestowal of the title of doctor of medicine *honoris causa* on the composer Reger on the occasion of the centennial of the University of Berlin, for in the diploma that was granted him at the time attention was called to the fact that his music had served to calm and comfort many patients. A short time after this honor was bestowed on Reger, a friend found him working on a new musical composition and inquired as to the theme. Reger, it is said, replied that he was working on his Opus 606 as evidence of his gratitude for the honorary doctor's title he had received. He of course had in mind that the arsphenamin of Ehrlich first became known as "606."

Personal

Prof. Hüppe, the hygienist, who was for many years director of the Hygienic Institute in Prague, celebrated, August 24, his seventieth birthday. Although he was a pupil and assistant of Robert Koch, he was able, at an early period, to emancipate himself from the one-sided conception of bacteria with reference to the causation of infectious diseases, and through his insight into the relationships between social conditions and disease he became one of the founders of social hygiene. He was the first to establish the frequent elimination of typhoid bacilli through the urine; he also observed the occasional pathogenic effect of *Bacterium coli*.

His researches on water hygiene, the decomposition of milk and other problems of every-day nutrition are also important. He has published also several valuable articles on the importance of physical exercise. His book "Hygiene der Körperübungen" appeared recently in a second edition. Since his retirement, ten years ago, from his position in Prague, Hüppe has been living in Dresden.

Geheimrat Uhlenhuth has received a call to the chair of hygiene in Bonn, as the successor of Professor Neumann, who has accepted the position left vacant in Hamburg by the death of Professor Dunbar. Uhlenhuth was offered the chair of hygiene in Berlin, as the successor of Geheimrat Flügge, but refused the call because the salary and appointments did not come up to his expectations. He accepted instead a position as director of the enlarged Behring Institute for Experimental Therapy in Marburg. However, his expectations do not seem to have been realized in Marburg, especially as regards his professorial activities at the university. Whether he will, on that account, accept the call to Bonn, remains to be seen.

Marriages

JOSEPH S. MARK, Woodbridge, N. J., to Miss Vivienne Mabel Delaney of South Orange, N. J., September 6, at New York.

LIEUT. EMMETT J. BRADY, M. C., U. S. Navy, San Diego, Calif., to Miss Elsa Wolfram of Bremerton, Wash., recently.

WILLIAM DOVE NOBLE, Baltimore, to Miss Dorothy Belle Kleinfelter of Asbury Park, N. J., September 14.

HENRY A. MEYERS, Davenport, Iowa, to Miss Anastasia Mosier of St. Louis, September 18, at Chicago.

CHARLES B. MCGLUMPHY, Iowa City, to Fraülein Elly Hiller of Vienna, Austria, at Vienna, July 31.

DONALD B. GLEZEN, Cincinnatus, N. Y., to Miss Florence Emily Acker of Worthville, N. Y., August 8.

CHARLES HENRY REMONDINO to Mrs. Lucille Blanche Redvine, both of San Diego, Calif., recently.

JOHN P. GREAVES, Sherwood, N. D., to Miss Adelaide Hamilton of Los Angeles, September 6.

HENRY VERNON SIMS, New Orleans, to Miss Katherine Roger of Thibodaux, La., September 7.

WILLIAM SPEROW, Carlisle, Iowa, to Miss Lola Rodger of Iowa City, at Newton, Iowa, recently.

JOHN ROSCOE MCNUTT, Two Harbors, Minn., to Miss Elsie Gerlach of Barnum, in August.

WILLIAM VERNON CONE, Iowa City, to Miss Avis Ellen Wood, at Muscatine, recently.

EDWIN O. SWANSON, St. Paul, to Miss May Ludke of Amery, Wis., September 14.

T. LEROY JACOBSON, Delavan, Wis., to Miss Bessie Ford of Fennimore, Wis., August 7.

PERRY MCDOWELL TIBBINS, Beech Creek, Pa., to Miss Grace Bloom of Sunbury, recently.

FREDERICK L. NELSON to Miss Lorenza Ingraham, both of Ottumwa, Iowa, recently.

JOHN E. TOWOHIG to Miss Helen F. Murphy, both of Fond du Lac, Wis., August 22.

FREDOLPH H. MAGNEY to Miss Ruth Taylor, both of Duluth, Minn., August 15.

AURA J. MILLER to Miss Mamie Turnipseed, both of Iowa City, recently.

Deaths

William Sill Foster ● Pittsburgh; Jefferson Medical College, Philadelphia, 1866; fourth vice president of the American Medical Association in 1907 and from 1902 to 1905 a delegate to that body from Pennsylvania. Dr. Foster was born in Pittsburgh in 1842 and enlisted in the Civil War while a student at Washington and Jefferson Colleges. During the Spanish-American War he saw home service and during the World War was appointed a captain in the reserve corps. He served on the staff of the Passavant Hospital, the Allegheny General Hospital, the Presbyterian Hospital and the Western Pennsylvania Hospital. Dr. Foster was a member of the Academy of Science and chairman of the committee on medical relief and of the war record committee of the Allegheny County Medical Society, of which he was president in 1890. At one time he served as select councilman under the Republican administration; died, September 17, aged 80.

Stuart Johnstone ● Chicago; College of Physicians and Surgeons (University of Illinois College of Medicine), Chicago, 1886; member of the Chicago Society for the Prevention of Tuberculosis; formerly professor of gynecology, Bennet Medical College; professor of gynecology and abdominal surgery, Jenner Medical College, and professor of diseases of the rectum, Post-Graduate Medical School; member of the staffs of the Cook County, the Chicago Postgraduate and of the Lakeside hospitals; died, September 28, aged 64, at the Lakeside Hospital, from carcinoma of the stomach.

Marco Luzzatto, New York; University of Turin, Italy, 1880; formerly assistant professor of physiology at the Uni-

● Indicates "Fellow" of the American Medical Association.

versity of Palermo; director of medical service for the board of health, Mantova, and coroner's physician for the town of Montelepre, Italy. On arrival in this country, Dr. Luzzatto became visiting physician to the Columbus, St. Mark's and the French hospitals; died, September 18, aged 67, at a sanatorium in New York.

Adam Szwajkart ✱ Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1897; College of Physicians and Surgeons, Chicago, 1903; attending physician at the St. Mary of Nazareth Hospital; in 1913 he was appointed a member of the state medical board and in 1915 he was appointed Cook County physician and director of the Psychopathic Hospital; died, September 25, aged 61, from heart disease.

Henry Clay Munro ✱ Pleasantville, N. J.; University of Pennsylvania School of Medicine, Philadelphia, 1909; member of the Philadelphia Psychiatric Society; for several years superintendent of the Atlantic County Hospital for the Insane, and the Atlantic County Hospital for Tuberculosis, Northfield; aged 42; died, September 16, in a hospital at Philadelphia, from tuberculosis.

Thomas Vaughan Crandall ✱ Philadelphia; Medical Department of Columbia College, New York, 1865; member of the Obstetrical Society of Philadelphia, and the North-Western Medical Society; formerly on the staffs of Garretson, St. Joseph's and Samaritan hospitals; aged 82; died, September 22, at the home of his daughter.

Percy Trant Hickson Norcop, Tallulah Falls, Ga.; L.R.C.P., Edinburgh, 1877; F.R.C.S., Edinburgh, 1879; served for twelve years in the British navy as physician and surgeon, and made four trips around the world; died, September 14, aged 69, at St Joseph's Infirmary, Atlanta.

John Alexander McGarry ✱ Los Angeles; University of Southern California College of Medicine, Los Angeles, 1898; formerly instructor of clinical gynecology, University of California; died, July 1, aged 46, from an overdose of luminal taken accidentally.

William M. Farr, Albuquerque, N. M.; Chicago Medical College, 1878; formerly mayor of Kenosha, Wis.; local surgeon for the Chicago and Northwestern Railroad for twenty-five years; died, September 10, aged 68, from cerebral hemorrhage.

Daniel Swift Burr, Binghamton, N. Y.; Geneva Medical College, Geneva, N. Y., 1868; member of the Medical Society of the State of New York; formerly city health officer; died, August 23, aged 76, from carcinoma of the prostate and bladder.

Harold Staniford Warren, Yreka, Calif.; Cooper Medical College, San Francisco, 1905; member of the Medical Society of the State of California; in charge of the Siskiyou County Hospital; died, September 21, aged 39, following a long illness.

Andrew Edward Forster ✱ Philadelphia; Jefferson Medical College, Philadelphia, 1904; member of the Michigan State Medical Society; died, August 24, aged 46, at the Misericordia Hospital, following an operation for carcinoma of the liver.

Richard Norman Foster, Chicago; Hahnemann Medical College and Hospital of Chicago, 1869; emeritus professor of obstetrics at his alma mater; practitioner in Chicago for fifty years; aged 88, died, September 25, at Oceano, Calif.

John Harrison Bull ✱ Indianapolis; Medical Department University of Indianapolis, Indianapolis, 1903; served in the M. C., U. S. Army, during the World War; aged 44; died, September 17, at a sanatorium in Battle Creek, Mich.

Henry Vose Reynolds ✱ Brookline, Mass.; Boston University School of Medicine, Boston, 1883; aged 61; was shot and killed, September 23, when he went to the assistance of a patrolman who was being fired at by a negro.

John A. Asher, Trenton, Mo.; Medical Department of the University of the City of New York, 1881; member of the Missouri State Medical Association; formerly county coroner; died, August 7, aged 68, from pernicious anemia.

Melancthon Hilbert, Le Mars, Iowa; Rush Medical College, Chicago, 1869; Civil War veteran; formerly mayor of Le Mars; county recorder; at one time justice of the peace; aged 81, died recently, at Hot Springs, S. D.

Howard Locke Vail, Scranton, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1903; served in the M. C., U. S. Army, during the World War; died, July 21, aged 42, at Hawley, from uremia.

Robert G. Loyd, Royse City, Texas; Memphis Hospital Medical College, Memphis, Tenn., 1893; member of the State Medical Association of Texas; died, July 23, aged 64, from cerebral hemorrhage.

J. B. Middleton, Grenada, Miss.; Memphis, Hospital Medical College, Memphis, 1893; member of the Tennessee State Medical Association; died suddenly, September 13, aged 62, from heart disease.

Robert Carson Kinnaman, Ashland, Ohio; Cincinnati College of Medicine and Surgery, 1873; member of the Ohio State Medical Association; died, September 7, aged 74, from septicemia.

Frederick William Kelley, Bridgewater, N. S.; Medical School of Maine, Portland, 1883; died recently, at the Victoria General Hospital, Halifax, following a short illness.

Max Symore Kahn, Houston, Texas; Medical Department of the Tulane University of Louisiana, New Orleans, 1904; aged 39; was shot and killed in the street, September 15.

Alfred G. Poppe, Adams, Wis. (licensed, Wisconsin, 1899); died, August 7, aged 64, at the Emergency Hospital, Milwaukee, from heart disease and chronic nephritis.

Frederic S. Sandborg, Seattle; Barnes Medical College, St. Louis, 1904; member of the Washington State Medical Association; died, September 11, aged 52.

David Markle McMasters, Russellton, Pa.; Bellevue Hospital Medical College, New York, 1871; died, August 5, aged 74, from carcinoma of the prostate.

Henry Herbert Stebbins, Thonotosossa, Fla.; Bellevue Hospital Medical College, New York, 1885; aged 75; died, August 29, at a hospital in Tampa.

George Milo Thomas, Adams Centre, N. Y.; Albany Medical College, Albany, N. Y., 1917; died, September 8, aged 39, following a long illness.

Robie Dugwell Bentley, Truro, N. S.; Dalhousie University Faculty of Medicine, Halifax, N. S., 1897; aged 53; was shot and killed, July 24.

Margaret L. Sabin, Lincoln, Neb.; Chicago Homeopathic Medical College, 1879; died, September 6, aged 87, from cerebral hemorrhage.

William A. Price ✱ Hereford, Texas; Louisville Medical College, Louisville, 1893; died, July 10, aged 55, from chronic interstitial nephritis.

James G. Webster, Clinton, Ind.; Medical Department of the University of the City of New York, 1864; died, September 14, aged 93.

Alexander Hamilton, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, Toronto, 1870; died suddenly, July 30, aged 78.

Patrick Charles Corrigan, Omaha; College of Physicians and Surgeons, Buffalo, 1880; died, August 5, aged 71, from heart disease.

Richard Stayner Graves, New Haven, Conn.; Yale University School of Medicine, New Haven, 1897; died, September 4, aged 50.

Edgar Mason Cook ✱ Everett, Wash.; Pulte Medical College, Cincinnati, 1883; died, July 29, aged 63, from chronic nephritis.

Adoniram Judson Morse, Oakfield, Wis.; College of Physicians and Surgeons, Chicago, 1890; died, September 4, aged 58.

Francis A. Petty, Westford, Vt.; University of Vermont College of Medicine, Burlington, Vt., 1885; died, July 14, aged 66.

Thomas Fleming Lanham, Grafton, W. Va.; College of Physicians and Surgeons, Baltimore, 1880; died, August 25, aged 72.

William W. Esch, Chicago; Jenner Medical College, Chicago, 1906; died, September 23, aged 46, from heart disease.

Theophilus Sprague ✱ Sheffield, Ill.; Rush Medical College, Chicago, 1870; Civil War veteran; died, September 21, aged 75.

John Hartman Matthews, Cottonwood, Ala. (licensed, Alabama, 1888); died, July 26, aged 64, from heart disease.

George W. Weaver, Tulsa, Okla.; Jefferson Medical College, Philadelphia, 1873; died, September 5, aged 72.

Correction.—A clipping recently received from the Tacoma (Wash.) *Ledger* stated that Dr. P. L. Sanders of Bremerton had died suddenly. This item was published in THE JOURNAL, September 23. Dr. Sanders is still living.

The Propaganda for Reform

In This Department Appear Reports of The Journal's Bureau of Investigation, of the Council on Pharmacy and Chemistry and of the Association Laboratory, Together with Other General Material of an Informative Nature

ONE WAY OF GETTING A DIPLOMA

The Interesting Case of Charles Wade Page

Charles Wade Page is at present practicing in Tampa, Fla., on the basis of a license issued by the Eclectic Board of Medical Examiners of Florida in December, 1919. The state law of Florida at the time Page's license was issued, required as a pre-requisite to licensing, the possession of a diploma or a certificate of graduation from a medical college. So far as our records show, Page possesses no such diploma or certificate and has never been graduated by any medical college.

OMNIBUS

SANUSEM

Collegii Medici Americani

CHARTERED MAY 20TH 1878

ADUTORITATE HOMS CONGRESSA

Photographic facsimile (greatly reduced) of the sample diploma sent by Page to the engraving house asking that six diplomas just like sample (including the signatures of the officers and professors) be made to his order. In the original that portion of the parchment which presumably had borne the name of the graduate had been crudely cut out, while around the cut area were evidences of a previous attempt to erase the name.

In August, 1919, the Biographical Department of the American Medical Association sent Page a personal information blank requesting him to give data regarding his graduation, licensure, etc. This was done because Page in submitting an advertisement for insertion in The Journal had signed himself "Dr." while the records failed to show any man of this name legally entitled to call himself a physician. In reply to this request for information, Page wrote in part:

"I cannot fill out your card because I have a year to do before I graduate. I have a temporary license to practice medicine in Florida for 1919. This license was given me by the board so I could earn enough money to complete my education."

This, it should be borne in mind, was in August, 1919, when he had "a year to do" before he would be graduated; yet a license was issued in December, 1919. Either Page's statement that he was practicing on a temporary license was a falsehood or the law had been violated, as Florida makes no provision for the issuance of temporary licenses to any but graduates.

In 1920, when Page was practicing in Palatka, Fla., The Journal was informed that Page had been traveling for an optical house spending a day or two at various places fitting glasses. Prior to that he was said to have been connected in some capacity with an insurance concern.

In February, 1921, Page sent in a classified advertisement for insertion in The Journal. At this time he was living in Tampa. The advertisement read (spelling and composition as in the original) thus:

"For sale complete office equippment, eye, ear, nose and throat $10,000 a year. Will except auto or real estate in Florida or Arkansis as part."

Page was notified that, as the records failed to show that he was a graduate physician and as particulars regarding the announcement that he wanted published were not given, the advertisement was not acceptable.

PAGE WOULD ENTER THE DIPLOMA BUSINESS

In August, 1922, Dr. E. J. Goodwin, Secretary-Editor of the Missouri State Medical Association, wrote to The Journal stating that C. Wade Page had written to a high-grade business concern in St. Louis asking it to print for him (Page), on parchment, six diplomas of the American Medical College of St. Louis, including the names of the professors and with the order, when done, to insert six different names of supposed graduates. The American Medical College, it should be stated, was an eclectic institution that ran for many years; it dropped eclecticism in 1910. It went out of existence under that name in 1912, when it became the Medical Department of the National University of Arts and Sciences, which in turn became extinct in 1918.

The letter Page had written bore a letterhead reading: "C. Wade Page, M. D., Eye, Ear, Nose and Throat, Tampa, Florida" and ran thus:

"The Gast Litho Co., St. Louis, Mo.

Gentlemen. I am authorized by the former officers of the American Medical College, St. Louis, Mo. to ask if you did thire Diploma engraving for them and if so if you still have this Plate and can you duplicate 6 copies of the engraving upon genuine Parchment for us and the cost of the same in case you do not have this engraving do you know the lithographer that has Could you Kreproduce this from a specimen Diploma of the College & cost of same I await your reply.

C. Wade Page, Secty."

It is worthy of note that Page signs himself "Secty." The Gast Bank Note Company took the matter up with some St. Louis physicians who immediately brought the case to the attention of Dr. Goodwin. In the meantime, the company wrote a noncommittal letter to Page stating that it could not advise him on the matter until a copy of what was desired had been submitted and suggesting that Page send a sample of the diplomas he wanted. A few days later there came from Page a diploma of the American Medical College signed by the college secretary, president and vice-president and by all the various professors and dated March 25, 1902. The diploma (which together with all the correspondence, was sent to The Journal office and photographed) showed evidence of an attempt to erase the name of the person for whom it was originally issued, and, the attempt failing, that part of the parchment containing the name had been crudely cut out. We reproduce the diploma in facsimile; the mutilation does not show in the reproduction as it does in the original photograph.

PAGE BECOMES "SECRETARY"

Accompanying this diploma was a letter from Page in which he signed himself "Secretary of the American Medical College." In it he stated "We desire 4 coppys so give me prices on 4 and 6." The Gast Bank Note Company immediately wrote Page that it had received the sample copy but that it did not have the plate from which the diploma was made and that the cost of making a new engraving would be

approximately $75 with $25 additional for making the diploma. To this Page replied—still signing himself "Secty." —that he wanted six diplomas like sample and insisted that they "must be just like it with the names of all the Professors as some are now Dead and we cannot get an exact Duplicate unless you follow Instructions." Page stated further that he would furnish the company with the names that "we wish to Appear on these Diplomas" and enclosed a check for $25 part payment in advance.

In the meantime, Dr. Goodwin had written to Dr. J. J. Link of St. Louis apprising him of Page's action. Dr. Link was for some years treasurer and, for a period, both president and treasurer of the American Medical College. In reply, Dr. Link said that Page was not known to the Board of Trustees of the American Medical College and had no authority to have diplomas of the American Medical College engraved or printed. He pointed out that a duplicate diploma was rarely issued by that school and then only by a vote of the Board of Trustees on receipt of an affidavit from an applicant who was known to be a graduate of the school, to the effect that his diploma had been destroyed. In such cases the duplicate diploma was imprinted with the word "Duplicate."

THE FORGED TELEGRAM

In answer to Page's letter accompanying the check the Gast Bank Note Company wrote that they would have to have authority from the president of the college before proceeding with the work. To this Page replied:

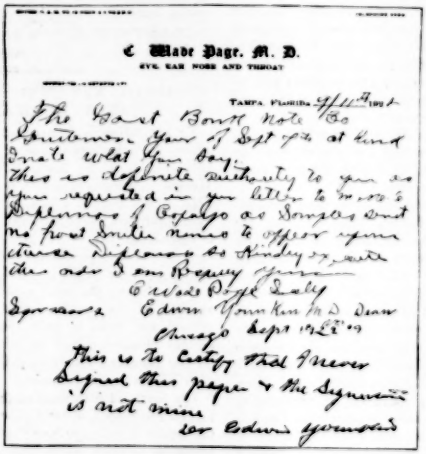
"Gentlemen: I sent your letter of Sept. 1st to Dr. Younkin Dean at Orlando, Fla. he is confined there with Dengue fever asking him to Instruct you just what he wanted to appear upon these Diplomas. Kindly communicate with me upon advise from him."

The facts are Dr. Edwin Younkin, of the old American Medical College, was not at Orlando, Fla., but was in Chicago! Nevertheless, a Western Union "night letter" came to the Gast Bank Note Company from Orlando, Fla., signed "Edwin Younkin, M. D., Dean." It read:

"Give authority to make six diplomas as specimen per Dr. Page. No facsimile wanted. Proceed with work. Write Dr. Page the secty."

The company again wrote Page stating that it had received a telegram purporting to be signed by "Edwin Younkin, M.D., Dean" but that it could not proceed on such an order but would need a written signed order. Page immediately replied that he had written a letter giving the company his (Page's) authority to make six diplomas and had sent the same to Dr. Younkin to be countersigned. In due time a letter came to the Gast Bank Note Company with the double signatures: "C. Wade Page, Secty., Edwin Younkin, M.D., Dean." We reproduce this letter in facsmile and it will be noted that below the letter, as sent to the Gast Bank Note Company, is a statement actually signed by Dr. Edwin Younkin, certifying that he never signed this letter. This statement was written by Dr. Younkin when a representative of THE JOURNAL laid the facts and the exhibits in the case before him.

Here the case rests so far as THE JOURNAL is concerned. What are the authorities in Florida going to do about it?



C. Wade Page, M. D.
EYE, EAR NOSE AND THROAT

TAMPA, FLORIDA, Sept 7th 1922

The Gast Bank Note Co
Gentlemen: Your of Sept 2d at hand
Don't what you say.
This is definite authority to you as
you requested in your letter to write to
Superintendent of Capitol as Douglas Dent
no first Initial name to appear upon
Certificate Diplomas as Kindly proceed
thus order I am Respectfully Yours
C Wade Page Secty
Signature Edwin Younkin M.D. Dean
Chicago Sept 1922 09
This is to Certify that I never
Signed this paper & the Signature
is not mine
Dr Edwin Younkin

Photographic facsimile (reduced) of a letter signed "C. Wade Page Secty." and "Edwin Younkin M.D. Dean." This letter was written by Page and, as alleged by Page, sent to Orlando, Fla., to be countersigned by Dr. Younkin. The facts are Dr. Younkin was not in Florida but in Chicago, and when the original letter was taken to him by a representative of THE JOURNAL, Dr. Younkin certified that he never signed the letter.

Science.—In science there are no secrets and no cults.—Wolbach, *New Growths and Cancer*, Harvard University Press, 1922.

Correspondence

SECTION REPRESENTATION IN THE HOUSE OF DELEGATES

To the Editor:—At the recent session of the Association at St. Louis, it was proposed to do away with the election of members of the House of Delegates from the sections of the Association. It was urged that each member of the Association had the right to be represented in the House of Delegates through his state medical society, and that for members of the sections also to choose delegates was "double representation," and therefore unfair.

That this claim of unfairness is entirely without foundation becomes evident when the facts are examined. Every member of the American Medical Association has the right through his state medical society to take what part an individual member can in choosing members of the House of Delegates. Every member may, if he wishes, become a Fellow of the Association, and aid directly in supporting the organization. Every Fellow has an equal right to attend the session of the American Medical Association, register in any one section he chooses, and take a similar part in the choosing of one delegate from that section. Every Fellow of the Association has, it is admitted, two opportunities to participate in the choice of delegates, and his support of the organization warrants it. Any suggestion that this kind of "double representation" is "unfair" is false and misleading.

It is difficult under universal suffrage to get voters always to exercise their rights of franchise. Some will go to one election, some to another; only a few will vote on every question or for every office placed on the ballot. But because many do not exercise their opportunities for voting to the full extent, it cannot be claimed that there is any injustice in the law that offers those opportunities freely and equally to all. Because some are not sufficiently interested in the Association to attend its annual sessions and take part in the proceedings of one of its sections, they are not unfairly treated because others do avail themselves of the opportunity open equally to every member.

The annual session of the American Medical Association was at first the whole of the Association. The scientific work of the Association has always been done in and through the annual sessions. From the annual sessions have come the impulse and the plans that have created and enormously extended the state and county medical societies. The annual session is now called the Scientific Assembly of the Association; its scientific work is done in the sections. So far as the sections are essential to the work of the Association, their proper interests should be safeguarded in the organic law and the governing body of the Association; and the

earlier and later history of the Association shows how carefully the plan for doing this has been developed, and how well it is working.

In a general way, three plans of representation in the governing body of the American Medical Association have been tried. In the beginning, all sorts of medical organizations were invited to send delegates to form and govern the Association. When it met in Baltimore in 1848, there were Philadelphia delegates registered from the College of Physicians of Philadelphia, the Philadelphia Medical Society, five medical colleges, two quiz associations, three hospitals and dispensaries and a local society, besides a Philadelphia delegate from the Pennsylvania State Medical Society. One member of these organizations might well have participated in the selection of a half dozen or more of these groups of delegates, while another member belonging to but one represented body had only his single vote.

Thirty years later, the right to send delegates to the American Medical Association was narrowed to the state medical societies, and the medical organizations affiliated with them that had adopted the code of ethics of the American Medical Association. But still the state delegations were composed of double sets of delegates, as those from the Pennsylvania State Medical Society, Philadelphia County Medical Society and from the College of Physicians of Philadelphia; and of "permanent members" who held their membership independent of local societies. Exactly equal opportunity for representation in the American Medical Association for all its members was not secured until in 1901 the present plan was adopted, for a House of Delegates elected by the state medical societies and the scientific sections.

The actual government of the American Medical Association in its earlier years was farther removed from the influence of the mass of the profession, acting through state medical societies, than the foregoing summary of its "plan of organization" would indicate. All officers were selected by the Nominating Committee, composed of one from each state, who was chosen at a caucus of members from the state, consisting wholly of those who were in attendance at the American Medical Association annual session. At the close of the opening meeting, the members from each state were told to get together in a particular part of the hall. Here these state delegations, amid the confusion of surrounding delegations and the talk of renewed acquaintance, named their chairmen and secretaries and chose their members of the nominating committee, whose names were then reported to the Secretary of the Association and announced at the next session.

In the selection of this nominating committee, the two or three members present from California or Oregon had just as much influence as the two or three hundred in attendance from some nearby eastern state. And this committee named not only every officer of the general association, but every section officer as well. The choice of the officers of a section was made by members of this committee, who had never attended a meeting of the section, and felt no especial interest in the branch of medicine or surgery to which the section was devoted.

This situation became intolerable; and in 1891 the Section on Ophthalmology and other sections each chose an "Executive Committee" of three, "whose general duties shall be to look after all matters pertaining to the development of the section, not already in the hands of existing officers." Within three years every section in the Association had chosen a similar executive committee, and these committees had been united into the General Business or Executive Committee of the Association. This General Business Committee, constituted wholly by the sections, each section having three representatives therein, rapidly became the actual working body of the American Medical Association. Propositions for action were referred to it, and action taken on its recommendations. For ten years its functions developed rapidly in importance; and it worked most steadily and earnestly for the reorganization of the American Medical Association. Again and again the proposed amendments were laid on the table, or their reintroduction blocked for a year, until in 1901 success crowned the efforts of the reformers, who had continued to work in and through the sections, in spite of the parliamentary expedients of medical politicians and the confusion of the general meetings.

The reorganization thus effected gave the Association its House of Delegates, in which for the first time the state medical societies were accorded effective representation in the governing body of the Association. With other improved plans of organization and conduct of business, this brought the era of prosperity that the Association has enjoyed for twenty years. The plan of reorganization, the fruit of work in and through the sections, largely accomplished by the General Business Committee in which only the sections were represented, handed over to the state medical societies nine tenths of the representation in the governing body of the Association.

EDWARD JACKSON, M.D., Denver.

SIXTH NATIONAL CONGRESS OF THE JAPAN MEDICAL ASSOCIATION

To the Editor:—A program consisting of more than 1,600 papers from an attendance of 3,000 delegates is the remarkable record of the Sixth National Congress of the Japan Medical Association, which was held at Kyoto, April 1 to 5, 1922. This record, which, allowing for the presentation of more than one paper by some delegates, represents the participation of nearly 50 per cent. of the delegates of the congress in its proceedings, illustrates the tremendous activity of the Japanese in the medical sciences.

Furthermore, the total number of papers presented is not swelled by the usual number which at most medical congresses are "read by title," for practically every one of the sixteen hundred papers at this congress was given its place on the program, and was delivered within its allotted time of ten minutes by its author.

The first and fifth days of the congress were occupied with formal meetings and long papers read to the general session; the other three days were devoted to the meetings of the seventeen sections, whose programs each day began at 8 a. m., allowed one hour for lunch, and continued until the papers for the day were finished. The rapid progress of the program, with the almost continual shifting of wall charts and figures, gave one the impression of being in a sort of medical mill, which was officially receiving and recording the results of Japan's medical activity, and grinding out Japan's medical literature.

As the representative of the Peking Union Medical College, I was the Caucasian member of the Chinese delegation to this quadrennial congress. And as China was the only foreign country invited to send delegates, I was the only Caucasian in attendance, except for one or two Europeans and Americans who were resident in Japan and who attended an occasional meeting. This fact illustrates the isolation of Japan from the rest of the medical world. But it does not indicate that there is an attitude of aloofness on the part of Japan in the field of medicine. On the other hand, I was impressed with the eagerness which was manifested for closer contact with the West, and particularly with America, in medical work. This attitude was emphasized by the fact that the *Japan Medical World*, the only Japanese medical monthly published in English, presented one of its numbers to each delegate at the congress, and enclosed within each copy a

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separate sheet with the English word "welcome" in large letters at the top, followed by an explanation of the aim of the periodical to encourage intimacy between the medical professions of Japan and the English-speaking world.

This welcome, as unintelligible to most of the delegates as the papers of the congress were to me, was the written expression of the attitude toward me of every one whom I met at the congress. The dependence on Germany, under whose tutelage Japan's medical profession received its early training, is rapidly passing away, and the English language is supplementing or replacing German in the medical curriculum.

In the twenty-five years of the existence of Japan's National Medical Association, this is the first time that any foreign delegates have been invited to attend a congress. Officers of the association assured me that to the next congress, in 1926, they expected to invite delegates from Europe and America.

The seventeen sections of the National Medical Congress were composed of the seventeen medical societies which make up the national association, and which meet separately in other years for the presentation of their own subjects. Each had its meeting place in some part of the Imperial University of Kyoto, while the general meetings on the first and last days of the congress were held in the new municipal auditorium, which accommodates more than 4,000 people. Except for two addresses, the program was conducted entirely in Japanese. The two exceptions were the addresses by Dr. S. H. Chuan, head of the Chinese delegation, surgeon-general of the Chinese army, and director of the Army Medical College in Peking. Educated in China and America, his address of greeting at the formal opening of the congress was in classical Chinese, while his later address before the Section of Military Medicine was delivered in excellent English.

The well-known hospitality of the Japanese was abundantly demonstrated during and after the congress. Railroad fares, hotel accommodations and automobile transportation about Kyoto were furnished by funds from various sources. Two Japanese physicians from Manchuria were the untiring guides of the party. Formal and informal luncheons and dinners crowded the unoccupied hours, and some of the delegation had the privilege of visiting in the homes of residents of Kyoto.

At the conclusion of the congress the Chinese delegation was invited by the physicians of Tokyo to visit that city, and there, for nearly a week, the entertainment was continued. All the scientific institutions in Tokyo were visited, and official and unofficial dinners were attended. No doubt was left in the minds of the visitors that Tokyo is a modern, progressive city, encouraging the highest quality of scientific equipment and endeavor.

Discounting entirely the favorable impression that unstinted hospitality is sure to make on one, I was highly pleased with the scientific attitude and the public-spirited point of view of the leaders of Japan's medical profession. Any country could well be proud of these men, many of whom, though still active and scientifically productive, are the founders of modern medicine in Japan. Japan's chief handicap is the language barrier between her and the western world. This is as detrimental to her medical progress as it is to her political intercourse with other nations. On all sides I was assured of the eagerness of medical men for a closer contact with the medical profession of the English-speaking world. At present much medical research is being done as original work in Japan which has already been done in other countries. This is largely due to the fact that German medical literature is the only foreign literature available to most of the Japanese, since in the past German has been the only foreign language required in the Japanese medical curriculum. With the realization of the growing importance of American medical research, English as a scientific language is sure to displace, or at least to supplement, German to a large extent, and with this, the quality of Japanese medical research is bound to improve.

On the other hand, it must not be forgotten that much original medical research of the highest order has already been done in Japan. Witness Shiga's work on the dysentery bacillus, Inada's discovery of *Spirochaeta icterohemorrhagiae*, the work of Nagayo and his collaborators on the Japanese river fever, the numerous excellent contributions to the solution of the schistosome problem, and the discovery of the intermediate hosts of various other animal parasites. These and many other accomplishments point with great promise to the future efforts of the medical scientists of Japan.

Any attempt to summarize within reasonable space even the most important papers of this congress would fail to convey an adequate idea of the variety, extent and quality of the work presented. The only way in which one may approach a comprehension of this work is to read the titles of the papers, which are given, section by section, in the *Japan Medical World* for May and June, 1922. This list is a cross-section of the medical sciences in Japan today, and shows that in purpose and in method Japan is apace with Europe and America, and is doing pioneer work in many fields.

HENRY EDMUND MELENEY, M.D., Peking, China.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

SPAHLINGER'S TREATMENT FOR TUBERCULOSIS

To the Editor:—Enclosed find newspaper clipping on "Spahlinger's Tuberculosis Treatment." Have you any information concerning it?

N. H. J., Knob Fork, W. Va.

To the Editor:—I have a patient who is very much interested in obtaining information in regard to the so-called Spahlinger discovery of vaccine treatment against tuberculosis. As I have never heard of it I am enclosing a clipping and would appreciate any information that you have about it and where it may be obtained—if worthy of trial. I have discouraged this patient as much as possible about this new discovery, and doubt whether it can be any better than the ordinary tuberculin in use.

R. L., New Orleans.

To the Editor:—Will you please publish a brief abstract of Spahlinger's Treatment for tuberculosis and the work that has been done on it? Demands to raise money in this country to support and use it are being put forward, and wholly unreliable data about it have appeared in the lay press. I can find very little in the medical press.

P. K. B., San Francisco.

ANSWER.—According to newspaper reports which appeared in 1921, Spahlinger was a lawyer who had abandoned his profession for research work. He now appears to be connected with the Bacterio-Therapeutic Institute, Geneva. According to an article in the *Lancet*, London, Jan. 7, 1922, by Spahlinger, the treatment utilizes either one or both of two therapeutic principles, depending on the nature of the infection. In acute or rapidly progressing cases, passive immunization with special serums is used. In chronic afebrile pulmonary cases, in nonpulmonary forms and in cases "predisposed to" tuberculosis, active immunization with various special antigens is employed. This article contains no definite information in regard to the preparation of his products.

Professor d'Arsonval, member of the Institute of the Academy of Medicine, appears to have presented a report of British physicians to the French Academy of Science on the Spahlinger treatment.

Recently the newspapers reported that the British Red Cross was to purchase the treatment. So far as we know, British medical journals have contained no confirmation of this statement.

Some time ago, newspapers stated that the Rockefeller Institute had made an offer to secure the right to dispense the Spahlinger "serum" in the United States. An inquiry

sent to the Rockefeller Institute brought a denial of this newspaper statement: apparently the preparation had not been investigated by any one at the institute.

So far as we know, the sale of the Spahlinger treatment has not been authorized by the United States Treasury Department, which controls the importation and the sale of biologic products.

All that can be said for the Spahlinger treatment is that its exact nature does not appear to have been divulged, that it is in the experimental stage, and that the reported results lack confirmation.

PATHOLOGIC ANATOMIES — AFSAL

To the Editor:—1. Please let me know the author of the best and most recent pathologic anatomy? 2. What do you know regarding Afsal, a remedy for rheumatism?

A. J. Coley, M.D., Oklahoma City.

Answer.—1. Following is a list of references to recent books on pathologic anatomy:

Aschoff, Ludwig: Pathologische Anatomie (Vol. VIII, Handbuch der ärztlichen Erfahrungen im Weltkriege 1914-1918), Johann A. Barth, Dorrienstrasse 16, Leipzig.

Delafield, F., and Pruden, T. M.: Textbook of Pathology, with final section on postmortem examinations and methods of preserving and examining tissues. William Wood & Co., New York.

Ziegler: Special Pathological Anatomy, Vol. I, William Wood & Co., New York.

MacCallum, W. G.: Pathology, W. B. Saunders Company, Philadelphia.

Stengel and Fox: Pathology, W. B. Saunders Company, Philadelphia.

2. Afsal is being marketed by S. Lewis Summers. It is stated to be "diacetyl methylene disalicylic acid." This product was formerly marketed by the Organic Chemical Manufacturing Company (S. Lewis Summers, president) as Urasol. Urasol was one of a number of "Forma-Sol Compounds" marketed by the Organic Chemical Manufacturing Company. These were stated to be compounds of methylene-disalicylic acid. Sollmann, in an investigation of the value of "internal antiseptics" made for the Council on Pharmacy and Chemistry, reported (The Journal, Sept. 5, 1908, p. 818) that he had found Urasol pronouncedly and persistently nauseating. While the advertisements claimed that formaldehyd was gradually split off and acts as a urinary solvent, Sollmann found no evidence that formaldehyd was split off in the body or that the compounds had any discoverable antiseptic action on the urine. He could discover no ground for the claimed superiority over salicylates, and held the claim "they are the most valuable salicylic acid compounds known" a gross exaggeration. The manufacturer and a firm of commercial chemists having attacked the reliability of Sollmann's work, and a physician of standing having claimed that he had obtained good results with Urasol, the Council on Pharmacy and Chemistry appointed a referee. After an examination of the evidence, supplemented by independent work, the referee confirmed (The Journal, May 8, 1909, p. 1511) the findings of Sollmann, and held that the clinical results of the physician required confirmation.

BUSACCA'S GELATIN TEST FOR SYPHILIS

To the Editor:—What is Busacca's gelatin test for syphilis?

M. H.

Answer.—In the *Wiener klinische Wochenschrift* (**35**:523 [June 8] 1922), Dr. Attilio Busacca states that for his trials he used a 10 per cent. solution of sterilized gelatin (Merck brand). He made intracutaneous injections (usually into the forearm) of 0.1 c.c. of gelatin, after it had been rendered fluid by heating at a temperature of 37 C. He emphasizes that only solid gelatins, rendered fluid as needed, can be utilized for the test. Ordinary fluid gelatins seldom give a reaction. The local positive reaction in syphilis is identically the same as that which occurs in patients suffering from tuberculosis of the skin: At the site of the injection of gelatin there appears a reddening which varies in extent and is not sharply circumscribed; in the center, usually though not always, may be seen a small area of infiltration. When the reaction is intense, there is a swelling of the region concerned or of the reddened area, from which also lymphangitic streaks may radiate. The cutaneous reaction appears usually within six hours, but an absolutely definite interpretation is not possible until twenty hours have elapsed since the injection. The reaction disappears commonly in about thirty hours, leaving no trace, but occasionally it persists for forty-eight hours. A general reaction, such as fever, was never noted. The patients complain of a burning sensation immediately following the injection, but this soon disappears. In intensive reactions the patient feels a certain tension at the site of the injection. In 292 cases of syphilis in various stages of development, 208 (71 per cent.) were positive; forty-three (15 per cent.), negative, and forty-one (14 per cent.), uncertain. The Wassermann test applied to the same series of cases gave: positive, 240; negative, fifty-two. In other words, the Wassermann test proved positive in 82 per cent., the gelatin test in only 71 per cent., of the cases. The value of the gelatin test will be appreciated mainly by those practitioners who are practicing in places in which it is not possible to have an examination for spirochetes or a Wassermann test made. For such, it is claimed, it will be of great aid in the early diagnosis of the disease, which is today regarded as so important in connection with abortive treatment. The gelatin test cannot be used, as is the Wassermann test, for the control of therapeutic results.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

Arkansas: Little Rock, Nov. 14-15. Sec., Reg. Bd., Dr. G. W. Walker, Fayetteville; Sec., Eclec Bd., Dr. C. E. Laws, 803½ Garrison Ave., Fort Smith; Sec., Homeo. Bd., Dr. George M. Love, Rogers.

California: Sacramento, Oct. 16-19. Sec., Dr. Charles B. Pinkham, 906 Forum Bldg., Sacramento.

Connecticut: Hartford, Nov. 14-15. Sec., Reg. Bd., Dr. Robert L. Rowley, 79 Elm St., Hartford.

Connecticut: New Haven, Nov. 14-15. Sec., Eclec. Bd., Dr. James E. Hair, 730 State St., Bridgeport; Sec., Homeo. Bd., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

District of Columbia: Washington, Oct. 10. Sec., Dr. Edgar P. Copeland, Stoneleigh Court, Washington.

Florida: Tallahassee, Oct. 10-11. Sec., Dr. W. M. Rowlett, Tampa.

Georgia: Atlanta, Oct. 10-12. Sec., Dr. C. T. Nolan, Marietta.

Hawaii: Honolulu, Oct. 9-12. Sec., Dr. G. C. Milnor, 401 Beretania St., Honolulu.

Illinois: Chicago, Oct. 10-12. Supt. of Registration, Mr. V. C. Michels, Springfield.

Iowa: Des Moines, Nov. 1-3. Sec., Dr. Rodney P. Fagen, State House, Des Moines.

Kansas: Topeka, Oct. 10. Sec., Dr. A. S. Ross, Sabetha.

Michigan: Lansing, Oct. 10-12. Sec., Dr. Beverly D. Harison, 504 Washington Arcade, Detroit.

Nevada: Carson City, Nov. 6. Sec., Dr. Simeon L. Lee, Carson City.

New Jersey: Trenton, Oct. 17-18. Sec., Dr. Alexander MacAlister, State House, Trenton.

New Mexico: Santa Fe, Oct. 9-10. Sec., Dr. R. E. McBride, Las Cruces.

Oklahoma: Oklahoma City, Oct. 10-11. Sec., Dr. J. M. Byrum, Shawnee.

West Virginia: Huntington, Oct. 10. State Health Commissioner, Dr. W. T. Henshaw, Charleston.

Wyoming: Cheyenne, Oct. 9-11. Sec., Dr. J. D. Shingle, Cheyenne.

ANNUAL HOSPITAL CONVENTION IN CALIFORNIA

The second annual convention of the hospitals of California was held under the auspices of the League for the Conservation of Public Health at Pasadena, September 5, 6, 7 and 8. More than 300 hospitals were represented by more than 800 delegates and other representatives.

In opening the convention, the chairman, Dr. W. E. Musgrave, presented some facts and figures to show the magnitude of the problems involved in the campaign of hospital betterment in California. The following is a summary of his address:

ANNUAL COST OF SICKNESS AND HEALTH

Totals of a few items of the annual cost of sickness and health to the people of California are given in the accompanying table. These conservative figures show that the people of California are annually contributing and paying in taxes more than $28 for each man, woman and child for a few of the services of health.

ANNUAL COST OF SICKNESS AND HEALTH IN CALIFORNIA

Maintenance of hospital beds	$ 60,000,000
Official public health	12,000,000
Laboratories, etc.	5,000,000
Nurses' fees and nurses' maintenance	5,000,000
Semitrained nurses' fees	1,000,000
Hospital upkeep	10,000,000
Physicians' fees	15,000,000
Collected and expended by voluntary medical, health and medical welfare organizations	5,000,000
Total	$113,000,000

PHYSICIANS

There are approximately 4,000,000 people in California; there are 8,000 physicians in the state; 7,000 of these are licensed to practice medicine; about 5,000 are in active practice; about 4,000 are members of the California Medical Society; there is one physician in active practice to each 800 of population; $3,000 is the estimated annual gross average income of physicians of the state, and $15,000,000 represents the aggregate annual gross income of all physicians of the state.

These statistics show that California has an adequate number of educated physicians. The number of physicians is increasing faster than the population.

Based on the law of averages and available statistics, it is conservatively estimated that there are 120,000 people ill all the time in California, and that 900,000 people are ill every year.

The expenses for physicians' fees for sick persons, therefore, average $15 a year for each person. This, of course, is only a minor fraction of the total cost of sickness. This does not include the more than $5,000,000 of free service rendered annually by the medical profession of the state.

NURSES

There are about 5,000 registered nurses in the state; about 3,000 nurses are on duty with the public, exclusive of those on salaries in hospitals; $1,500 is the estimated average annual income and maintenance of a nurse; $5,000,000 represents the aggregate gross income and maintenance of the nurses of the state; $100,000 represents the aggregate gross income of "practical nurses," etc.

HOSPITALS AND SANATORIUMS

There are 500 hospitals in the state, of all classes, kinds and conditions; 45,000 is the approximate number of hospital beds available for the sick; 35,000 is the approximate average number of hospital beds constantly occupied; $4.50 is the average cost of maintaining a hospital bed for one day; $160,000 is the estimated daily cost of maintaining all hospital beds of the state; $60,000,000 represents the estimated aggregate annual cost of maintenance of all hospital beds of the state; $5,000,000 represents the estimated cost of roentgenray, laboratory fees, drugs, dressings and other essentials of sickness, exclusive of those cared for in hospitals; $10,000,000 represents an estimate of the annual cost of upkeep for hospitals and sanatoriums; $160,000,000 represents the approximate amount invested in hospital buildings, equipment and real estate in California; from $1,000,000 to $5,000,000 is invested annually in new hospitals and enlarging old ones in the state. This is a constantly increasing amount; exclusive of physicians, some 25,000 people are constantly employed in the hospitals alone in day and night service for the sick; more than 90 per cent. of the hospitals are conducted at a financial sacrifice to their owners or supporters and to the medical profession that staffs them.

PUBLIC HEALTH

Twelve million dollars is a conservative estimate of the amount of money spent by state, county, municipal and other official health agencies controlling and preventing disease.

COST OF HEALTH NOT INCLUDED

Impressive as are the foregoing figures of the costs of health to the people of California, many of the most expensive items incident to diseases are not mentioned. Some of these are:

The millions wasted by loss of earning time by patients, because of illness. If we consider that only 20,000 of the 120,000 people ill in the state all the time are earners, and that they earn only an average of $5 a day, this item alone amounts to $37,000,000 a year for California. The unknown millions spent for services of people, exclusive of physicians and nurses, whose earning time is lost in serving the sick. Unknown millions spent for "patent medicines," cure-alls and other self-prescribed treatments. Unknown millions extracted by quacks, cultists and miscellaneous so-called doctors, healers, and the like, of various species. Unknown millions spent in visiting spas, mineral springs, health resorts and other sure-cures of disease and maintainers of health. Millions spent in mineral waters, health water, freak foods, physical culture and various other combinations opposed to medicine. Vast millions collected and spent by voluntary health organizations, legitimate and useful as well as illegitimate and vicious.

QUESTIONS FOR THE FUTURE

Stupendous as are these figures, they are not complete. They should, however, cause thinking people to consider how this constantly increasing cost of health is going to be maintained. New hospitals are being built and old ones being enlarged, and there is a constant cry for more hospital beds. In southern California alone, hospital projects amounting to millions of dollars are under consideration to meet the demands of a rapidly growing population.

Medical education costs the people of California for its legitimate schools and accessories more than $2,000,000 a year, and these costs are constantly increasing. Official public health activities are costing the state more than $12,000,000 a year now, and are increasing all the time.

So-called health and medical welfare agencies of the voluntary type are constantly increasing in number, and no one can even estimate the vast sums now being contributed to their support.

Already the cost of these polyglot methods is producing complaint from those who must pay the bills. There are now twenty-seven different kinds of so-called "doctors," healers and other agencies and fakers claiming their cult to be the best method of curing the sick. All claim to be doing a large business produced by alluring advertisements. New cults are continually being invented. It would indeed take a seer to predict what the future will be.

Maryland June Examination

Dr. J. McP. Scott, secretary, Maryland State Board of Medical Examiners, reports the oral and written examination held at Baltimore, June 20-23, 1922. The examination covered 9 subjects and included 90 questions. An average of 75 per cent. was required to pass. Of the 68 candidates examined, 66 passed and 2 failed. Sixteen candidates were licensed by reciprocity. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Johns Hopkins University	(1920) 82, (1921) 82, 84, 85, (1922) 75, 78, 81, 82, 83, 83, 84, 84, 84, 85, 85, 86, 86, 86, 86, 86, 86, 87, 87, 88, 88, 89, 89, 90, 91, 91, 91, 91, 92, 92, 93	85, 92,
University of Maryland	(1920) 87, (1922) 76, 77, 78, 80, 83, 83, 83, 84, 84, 85, 85, 85, 87, 88, 88, 89, 89, 90, 90, 90, 91, 91	81, 82,
Temple University	(1919)	79
McGill University	(1921)	75
University of Palermo	(1915)*	75
University of Odessa	(1919)*	†
FAILED		
Howard University	(1919)	†
Medical College of Virginia	(1917)	74

College	Year Grad.	Reciprocity with
LICENSED BY RECIPROCITY		
Rush Medical College	(1916)	Ohio
Baltimore Medical College	(1905)	Dist. Colum.
College of Physicians and Surgeons, Baltimore	(1903)	New Jersey
Johns Hopkins University	(1917)	Missouri
Maryland Medical College	(1905)	Delaware
University of Maryland	(1918)	District of Columbia, North Carolina, (1920, 2) West Virginia
University of Minnesota	(1919)	Minnesota
Bellevue Hospital Medical College	(1898)	New York
Ohio State University College of Medicine	(1915)	Ohio
University of Pennsylvania	1895)	New Jersey, (1921) Virginia
Meharry Medical College	(1898)	Louisiana, (1918) Tennessee

* Graduation not verified.
† No grade given.

New Mexico April Examination

Dr. R. E. McBride, secretary, New Mexico State Board of Medical Examiners, reports that five candidates were licensed on diploma at the meeting held at Santa Fe, April 10-11, 1922. The following colleges were represented:

College	Year Grad.	Number Licensed
LICENSED ON CREDENTIALS		
College of Physicians and Surgeons, Chicago	(1899)	1
St. Louis University School of Medicine	(1907)	1
University of Missouri	(1904	1
Eclectic Medical Institute	(1892)	1
University of the South Medical Department	(1901)	1

Book Notices

NEW AND NONOFFICIAL REMEDIES, 1922. Containing descriptions of the Articles Which Stand Accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1922. Cloth. Price, $1.50. Pp. 453. Chicago: American Medical Association, 1922.

This is the official yearly publication of the Council on Pharmacy and Chemistry. In it the Council presents to the medical profession impartial, critical information concerning those proprietary medicines which the Council deems worthy of recognition. The book also contains descriptions of those nonofficial remedies rated by the Council as worthy of consideration by the profession.

Before a product is admitted to New and Nonofficial Remedies, these important requirements are stipulated: (1) a declaration of the quantitative composition of the article; (2) truthful therapeutic claims in marketing the article; (3) evident or potential therapeutic value.

As evidence of the disinterested character of the work, the descriptions of the preparations are based not only on the information submitted by the manufacturer or his agents, but also on investigations made by, or under the direction of, the Council. The statements made by the manufacturer or those interested in the marketing of the article are culled, and only those are accepted that are supported by substantiating evidence or conform to generally accepted facts. For the best interests of both the profession and the patients, physicians will safeguard all concerned by giving no consideration to a proprietary medicinal agent that has not been admitted to New and Nonofficial Remedies.

A feature that enhances the practical value of the book is the general discussion that introduces each group. For instance, the silver, the iodin, the arsenic and the animal organ preparations and the biologic products are each preceded by a general and thorough discussion of the group. These articles compare the value of the products included in the group with similar pharmacopeial and other established drugs which it is proposed that these proprietary preparations shall supplant.

Each year's edition of New and Nonofficial Remedies is so effectively revised as to be essentially a newly written book.

Physicians wishing to know why a given proprietary preparation is not described in New and Nonofficial Remedies will find at the end of the book "References to Proprietary and Unofficial Articles Not Described in N. N. R." In this chapter are given references to the published articles dealing with preparations that have not been accepted. These reports include references to the Reports of the Council, to reports of the American Medical Association Chemical Laboratory, and to articles that have appeared in THE JOURNAL.

New and Nonofficial Remedies should be in the hands of all physicians who prescribe drugs. The book contains authoritative information about the newer materia medica which cannot be found in any other publication.

ENFERMEDADES DE LOS INTESTINOS. Por Luis Urrutia. Paper. Price, 25 pesetas. Pp. 542. Madrid: Calpe, 1921.

This volume on intestinal diseases is a companion to the previous book by the author on "Diseases of the Stomach" (reviewed in THE JOURNAL, April 2, 1921, p. 956). In the thirty-three chapters there are taken up successively: examination, functional diagnosis and common and rare intestinal conditions, such as autointoxication, diarrhea, dyspepsia, constipation, Hirschsprung's disease, colitis, lithiasis, enteritis, ulcers, appendicitis, tuberculosis, cancer, syphilis, nervous disturbances and parasite infestations. The last chapter is devoted to diseases of the rectum and anus. In the new book the different subjects are discussed with thoroughness. In each disease medical and surgical treatment is set forth in detail, and the author usually illustrates his points by reference to cases in his own large practice. One of the most valuable parts of the book is the first chapter dealing with examination methods. The importance of securing a correct history is stressed, as it may furnish the diagnosis in fully 50 per cent. of cases. Chapter XV, on appendicitis, occupying seventy pages, is a complete and up-to-date review of this subject. Incidentally, the author denies the statement often made in English journals as to the rarity of appendicitis in Spain. The only thing really uncommon about the disease in his country is early surgical treatment, wherefore the mistaken conclusion that appendicitis is rare. Intestinal cancer seems rather scarce in Spain, the only available and incomplete statistics (1921) showing a prevalence of 6.6 per thousand deaths, compared with 11.8 per hundred deaths in the United States (1914). The author is fully conversant with foreign literature, and frequent mention is made of American writers, such as Einhorn, Mayo, Deaver, Rehfuss, Ochsner, Case, Lyon and Lynch. The discussions are short and to the point, and the writer has apparently succeeded in his appointed task of preparing a concise and useful handbook for Spanish-speaking physicians. The book contains an abundance of illustrations, many of them from Urrutia's own collection, and a number of them in colors.

STUDIES IN THE AETIOLOGY OF EPIDEMIC INFLUENZA. By James McIntosh, M.D. Medical Research Council. Special Report Series No. 63. Paper. Price, 2 shillings 6 pence net. Pp. 46, with 7 illustrations. London: His Majesty's Stationery Office, 1922.

The author's results lead him to conclude that the Pfeiffer bacillus is the etiologic agent in epidemic influenza. The evidence adduced in support of this position will not be generally regarded as conclusive.

Medicolegal

Not Unreasonable Refusal to Submit to Operation

(Bronson v. Harris Ice Cream Co., Inc. (La.), 90 So. R. 759)

The Supreme Court of Louisiana, in setting aside a judgment that was rendered for the defendant and decreeing instead one for the plaintiff, says that the latter suffered an injury to his knee in the course of his employment at the defendant's factory, and sued under the workmen's compensation act as for total disability. The disability was not contested, but was said not to be attributable to the accident but to the plaintiff's refusal to allow an operation to be performed, which would probably have cured him and would certainly have relieved him of all pain, and thus restored his ability to work. The operation, as the court understands, would have consisted in opening the knee and removing therefrom some broken parts. The plaintiff, being 59 years old, hesitated about having this done, and finally concluded not to, after consultation with several surgeons, who advised that the operation would not be dangerous to life or health and that the chances of success, in which event the use of the limb would be completely restored, and of nonsuccess, in which event the limb would become ankylosed and rigid, were about even. The plaintiff would have had to be anesthetized, and, being without means, would have had to enter the hospital as a charity patient, which appeared to him in the light of a humiliation.

For the legal action which the injured employee might have to recover full indemnification, the workmen's compensation act substitutes a right to partial indemnification, but seeks to facilitate and insure as far as possible the recovery of this indemnity. To that end, it takes away defenses, simplifies procedure and creates presumptions. That purpose would, in a large measure, be defeated if the door were opened for discussion as to whether the injured employee should or should not have recourse to an operation. This would be adding uncertainty, when the law clearly desires that there should be none. At the same time, it must be recognized that there might be an injury curable by an operation so simple and unattended by risk that plainly the real cause of the disability would be not so much the injury as the fact that the remedy at hand was not made use of. On this question as to whether under the workmen's compensation act an injured employee may have to submit to

operation as a prerequisite to recovery of compensation for disability, and on the further and much more difficult question of under what circumstances he will be required to do so, there is much jurisprudence. Most of these cases are inapplicable under the Louisiana statute, except so far as they establish the proposition that the injured employee must not be entirely unreasonable in refraining from an operation however simple and harmless.

In view of the age of the plaintiff, and of the seriousness of the operation, requiring the administration of an anesthetic, and in view of the natural (though unreasoning, and the court may add, groundless) prejudice against resorting to a charity hospital, the court does not think that the plaintiff's unwillingness to submit to an operation was entirely unreasonable. It was not the result of caprice, but of the natural dread of a surgical operation, always attended with more or less risk, especially after a certain age.

Practice of Medicine by Keeper of Bathhouse—Definition

(People v. Sekelyn (Mich.), 186 N. W. R. 479)

The Supreme Court of Michigan, in affirming a judgment convicting the defendant of practicing medicine without a license, says that she kept a public bathhouse. A woman who, being ill, went there and remained three weeks testified that, on her going there, the defendant expressed an opinion respecting the cause of the illness; that she had a room and baths; also that she was getting tablets and a glass of medicine each night; that "she called it medicine." The witness paid $2 a day, $1 for room and $1 for baths. No separate charge was made to her for the medicine. Another witness testified that on going to the bathhouse the defendant stated that she could not tell his ailment until he had stayed a week. He stayed two weeks. He said: "At night, when we got to bed, a man would give us medicine in a bottle, and she gave us pills. She gave me that for medicine, and people drank it, and I drank it also." He paid $2 a day, $1 for room and $1 for baths. The eating, he said, was separate. On the outside of the bathhouse, there was a large sign: "Mary Selken, Bathhouse." The defendant denied furnishing or giving medicine of any kind. The court holds that there was evidence to support the verdict.

Error was assigned on a portion of the charge to the jury wherein the court defined "the practice of medicine." The statutory definition was given:

> The actual diagnosing, curing or relieving in any degree, or professing or attempting to diagnose, treat, cure or relieve any human disease, ailment, defect, or complaint, whether of physical or mental origin by attendance or by advice, or by prescribing or furnishing any drug, medicine, appliance, manipulation or method, or by any therapeutic agent whatsoever.—Section 6732, Compiled Laws of Michigan of 1915.

Of this it was said in *Locke* v. *Ionia Circuit Judge*, 184 Mich. 535, 151 N. W. 623:

> This sweeping effort at definition with all provisions "otherwise" taken into account would render criminal numerous gratuitous and humane acts of relief and kindness to the suffering common amongst mankind in all ages and places.

Furthermore, it has been said that some things within this statute category may be innocently done. (Compare *People* v. *Watson*, 196 Mich. 36, 162 N. W. 943.) For correct definition, the exceptions made in the cases cited should be added to the language of the statute. But was the defendant prejudiced by the instruction? On the record stated there was no room for the exception above noted as to "gratuitous and humane acts of relief and kindness." Therefore the failure of the trial court to note such exception was not prejudicial to the defendant.

Evidence as to Father's Liability for Operation

(Cleveland v. Maddox (Ark.), 239 S. W. R. 370)

The Supreme Court of Arkansas says that the plaintiff instituted this action to recover on an account for professional services. A portion of the account was undisputed, but there was an item of $180 for services in a surgical operation on the defendant's son for which the defendant denied liability. No testimony was adduced by the defendant, yet on that $180 item the trial court directed a verdict against the plaintiff, on the ground that the latter's own testimony failed to make out a case not within the statute of frauds, which requires the assumption of the debt of another to be evidenced in writing. The plaintiff's testimony was that the defendant's son, who was a grown man with a family, was ill and a surgical operation became necessary; that the arrangements for the performance of the operation were made entirely by the defendant, and not by the son; and that the defendant agreed to pay the fee for the operation, and other expenses thereof. The plaintiff's statement was that the patient never consulted him at all about it; that the defendant "did all the consulting, made all the arrangements, and guaranteed to pay it; that is, he said he would pay the bill." In another part of his testimony, he stated that the defendant said: "Do what you think best for the boy, and I will pay the bill." He testified that, after the operation was over and proved to be successful, the defendant promised to borrow the money and pay the bill, but later stated that his wife refused to sign the mortgage, and subsequently denied liability on the bill. The plaintiff also offered to prove, by a nurse who attended the son at the time of the operation, that she was present at the time of the conference between the plaintiff and the defendant, and that the latter agreed to pay all the charges for the operation on his son. This testimony was excluded by the trial court from consideration by the jury. But the supreme court holds that the trial court erred in excluding this testimony and likewise erred in giving the peremptory instruction to the jury to return a verdict in favor of the defendant on this item of the account. The statute declaring physicians and trained nurses to be privileged from compulsion as witnesses concerning certain kinds of testimony had no application. The evidence was sufficient to show an original undertaking on the part of the defendant to pay the bill for surgical services rendered to his son. The plaintiff stated the agreement in different language, and it was for the jury to draw the inference from the language used as to whether the contract, if there was one entered into between the parties, was an original undertaking, or a collateral one within the statute of frauds. There being sufficient evidence to warrant a finding that there was an agreement on the defendant's part, in regard to the plaintiff's bill for services, and that it constituted an original undertaking, the issue should have been submitted to the jury under appropriate instructions. The judgment rendered was therefore reversed and the cause remanded for a new trial.

Society Proceedings

COMING MEETINGS

American Association of Railway Surgeons, Chicago, Oct. 18-20. Dr. Louis J. Mitchell, 29 E. Madison St., Chicago, Secretary.

American Child Hygiene Association, Washington, D. C., Oct. 12-14. Miss G. B. Knipp, 111 Cathedral St., Baltimore, Md., Secretary.

American Public Health Association, Cleveland, Ohio, Oct. 16-19. Mr. A. W. Hedrich, 370 Seventh Ave., New York, Secretary.

Association of Military Surgeons of the United States, Washington, D. C., Oct. 12-14. Col. James Robb Church, M. C., U. S. Army, Medical Museum and Library, Washington, D. C., Secretary.

Central States Pediatric Society, Cincinnati, Oct. 16-17. Dr. H. T. Price, Westinghouse Building, Pittsburgh, Secretary.

Delaware State Medical Society, Dover, Oct. 9-10. Dr. W. O. La Motte, Industrial Trust Building, Wilmington, Secretary.

Hawaii, Medical Society of, Honolulu, Nov. 19-21. Dr. F. J. Pinkerton, 45-46 Young Building, Honolulu, Secretary.

Kentucky State Medical Association, Paducah, Oct. 16-19. Dr. J. A. McCormack, 532 W. Main St., Louisville, Secretary.

Medical Association of the Southwest, Hot Springs, Ark., Oct. 16-13. Dr. W. H. Bailey, 115 West 21st Street, Oklahoma City, Okla., Sec'y.

Minnesota State Medical Association, Minneapolis, Oct. 12-13. Dr. Carl B. Drake, Central Bank Building, St. Paul, Secretary.

Mississippi Valley Medical Association, Rochester, Minn., Oct. 10-12. Dr. Henry Enos Tuley, 244 Francis Bldg., Louisville, Ky., Secretary.

Southern Medical Association, Chattanooga, Tennessee, Nov. 13-16. Mr. C. P. Lorane, Empire Building, Birmingham, Alabama, Secretary.

Tri-State District Medical Society, Peoria, Ill., Oct. 30-Nov. 2. Dr. William B. Peck, Freeport, Ill., Managing Director.

Vermont State Medical Society, Burlington, Oct. 12-13. Dr. W. G. Ricker, St. Johnsbury, Secretary.

Virginia, Medical Society of, Norfolk, Oct. 31-Nov. 3. Mr. G. H. Winfrey, 104½ W. Grace Street, Richmond, Secretary.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

September, 1922, **24**, No. 3

*Horse Serum (Foreign Protein) Treatment of Pyelitis and Pyuria. D. M. Cowie, Ann Arbor, Mich.—p. 179.

Dyskeratosis Diffusa Congenita. C. de Lange and J. C. Schippers, Amsterdam.—p. 186.

*Thymic Shadow in Infants. I. E. Liss, Scarsdale, N. Y.—p. 192.

*Inorganic Phosphate Content of Breast Milk of Mothers with Normal and with Rachitic Infants. L. Von Meysenbug, New Orleans.—p. 200.

Indications for Tonsillectomy in Infancy and Childhood. Is Modern Tendency Toward Universal Tonsillectomy Justified? H. Heiman, New York.—p. 204.

Applied Dietetics in Outpatient Departments. M. Ladd, Boston.—p. 211.

*Acute Infections of Urinary Tract in Infants and Children Subsiding without Appearance of Pus in Urine. W. R. Ramsey, St. Paul.—p. 218.

*Critical Study of Sixty-One Cases of Asthma and Eczema in Infancy and Childhood Controlled by Cutaneous Protein Sensitization Tests. H. Herman, New York.—p. 221.

Case of Myeloid Chloroma. O. W. Rowe and F. J. Hirschboeck, Duluth, Minn.—p. 239.

Allergic or Hypersensitive Condition. Review of Two Years' Progress. A. R. Cunningham, Boston.—p. 247.

Horse Serum Treatment of Pyelitis.—Having had difficulty in clearing up cases of pyelitis in infants and young children by the usual methods, it occurred to Cowie that if he could induce a hyperemia of the kidneys an infected pelvis might be cured. Horse serum brings about a hyperemia of the skin and joints and might induce a hyperemia of some of the internal organs. Cowie decided to induce hyperallergy in this patient with horse serum, and then produce an immediate reaction at will with the idea that during the reaction the kidneys might become engorged with blood and a result similar to that which occurs in arthritis after hyperemic stasis be produced. Nine cases are cited. The pus disappeared from the urine completely after the third subcutaneous injection with no recurrence to the present time.

Thymic Shadow in Infants.—The thymic shadow of 119 new-born infants was studied roentgenologically by Liss. The striking revelation in this study was the fact that in a group of average "normal" infants at birth, 42 per cent. showed the presence of a shadow suggesting a thymus measuring more than 3 cm., and this without gross symptoms. As the work progressed, retrogression in size of the shadow took place, the greatest change within the first few months, a steady change as the year went by, so that spontaneous disappearance of this shadow took place in the majority of cases. Some, however, persisted to the second year. As a rule, the children with large thymic shadows were well nourished, some were large chested, with thick and short neck, and without physical stigmata. The general impression was, that the larger thymic shadows were present in the thick and short necked infants.

Inorganic Phosphate Content of Breast Milk.—Inorganic phosphate determinations made by Von Meysenbug of serums of eight nonrachitic infants showed an average of 5 mg. per 100 c.c. Sixteen samples of breast milk of mothers whose infants showed no evidence of rickets contained an average of 4 mg. inorganic phosphate per hundred c.c. milk. The serums of seven rachitic infants were examined and the average value for the inorganic phosphate was 2.8 mg. per hundred c.c. The breast milk of mothers of rachitic infants was found to contain an average of 4.8 mg. inorganic phosphate per hundred c.c.—an average which falls within the "normal" range.

Obscure Fevers in Infants Due to Urinary Tract Infection.—Ramsey contends that many heretofore obscure fevers in infants and children are produced by infections with the colon bacillus, these infections may be local or perhaps systemic, and that they may be diagnosed by the characteristic general symptoms and by the elimination of an increased number of colon bacilli in the urine. Three cases are cited.

Protein Sensitization Tests in Children with Asthma and Eczema.—Thirty-one cases of bronchial asthma in children from 1 to 14 years of age, and thirty cases of eczema in children from 5 weeks to 7 years of age are described by Herman A total of 4,520 tests were performed, 979 of these being tests with the same proteins repeated. An average per patient of ninety-six different proteins (with twenty-eight repeated) were tried on the asthmatic group, and twenty-two different proteins (with five repeated) on the eczema group. Approximately one in every twenty-eight or twenty-nine tests performed gave a positive reaction, and one in every eleven or twelve tests was either positive or doubtful. As many as fourteen of the asthma cases and thirteen of the eczema cases gave no indication of hypersensitiveness as determined by skin tests. The proteins of egg, rabbit hair, cow's milk (especially the lactalbumin portion), mustard, chicken feathers and goose feathers, lamb, chicken, goose and duck, gave the most frequent positive reactions. A classification is given of the individual cases into sensitive and nonsensitive, and further into subgroups according to the type of proteins to which they were sensitive (i. e., whether food, animal epidermal, pollen, or bacterial), with the results secured in each subgroup. No cases were bacteria sensitive. The importance of focal infections as an etiologic factor in these children is stressed. Occasional findings which limit the usefulness of the protein sensitization test are mentioned.

American Journal of Psychiatry, Baltimore

July, 1922, **2**, No. 1

Broadened Interests of Psychiatry. A. M. Barrett, Ann Arbor, Mich.—p. 1.

New Evidence for Sympathetic Control of Some Internal Secretions. W. B. Cannon, Boston.—p. 15.

Habit Clinics for Children of Preschool Age. D. A. Thoms, Boston.—p. 31.

Recognition of Prepsychotic Children by Group Mental Tests. G. E. Hyde, Provo, Utah.—p. 43.

Costs of Social Service Department of State Hospital vs. Economies Effected Thereby. A. J. Rosanoff, Kings Park, N. Y.—p. 49.

Simple Reaction in Psychosis. F. L. Wells and C. M. Kelly.—p. 53.

Experiment with Simple Tests for Insane. M. Bates, Worcester, Mass.—p. 61.

*Defective Mental Make-up and Pernicious Forms of Torticollis, Tinnitus, Neuralgia and Pruritus. L. B. Alford, St. Louis.—p. 67.

Study of Institutional Escapes. C. F. Read and D. B. Rotman, Dunning, Ill.—p. 75.

Anhedonia. A. Myerson, Boston.—p. 87.

Defective Mental Make-Up and Tinnitus, Pruritus and Neuralgia.—The object of Alford's communication is to indicate that the pernicious forms of tinnitus aurium and pruritus of the anogenital region, spasmodic torticollis and trigeminal neuralgia may be similar in nature and to give the reason for this similarity. It is pointed out that with certain apparent exceptions, they are alike as to age and onset, course, resistance to treatment, predominance of one symptom in clinical picture, and central nervous origin. Tinnitus aurium is found not to be an exception if one accepts Gray's contention that the changes in otosclerosis must affect all parts of the biologic and physiologic unit subserving the function of hearing. Trifacial neuralgia is also not necessarily an exception, for the evidence commonly supposed to indicate a peripheral lesion is from another point of view equally in favor of a central disorder. The psychic deviations frequently associated with tinnitus do not seem to conform to classical types of mental disorder. Psychic deviations also are said to occur in the other forms but their nature cannot be ascertained. The nature of the patient's mental reaction to symptoms in these forms is indicative of something more than a peripheral disturbance.

Archives of Internal Medicine, Chicago

September, 1922, **30**, No. 3

*Interpretations of Initial Phases of Electrocardiogram with Special Reference to Theory of "Limited Potential Differences." T. Lewis, London.—p. 269.

*Case of Hodgkin's Disease Treated with Roentgen Rays for Six Years. K. R. McAlpin and W. C. Von Glahn, New York.—p. 286.

*Experimental Reproduction of Specific Histopathology of Influenza. G. Bachr and L. Loewe, New York.—p. 307.

Mechanism of Development of Non-Bacterial, Chronic Cardiovalvular Disease. W. Thalhimer, Milwaukee.—p. 321.

*Bronchospirochetosis in China. E. C. Faust, Peking, China.—p. 343.

*Tetany: Report of Cases with Acid-Base Disturbance. S. B. Grant, Boston.—p. 355.

*Blood Pressure of Normal Cantonese Students. W. W. Cadbury, Canton, China.—p. 362.

*Renal Function and Amount of Functioning Tissue. T. Addis, San Francisco.—p. 378.
Studies in Kottmann Reaction for Thyroid Activity. W. F. Petersen, F. T. H'Doubler, S. A. Levinson and J. E. F. Laibe, Chicago.—p. 386.
*Glucose Mobilization Rate in Hyperthyroidism. B. J. Sanger and E. G. Hun, New York.—p. 397.

Interpretation of Initial Phases of Electrocardiogram.—According to Lewis' theory of limited potential differences, relative negativity should appear, first of all, at the basal contact; secondly, when the wave of excitation reaches the apex, the apical contact should appear relatively negative; finally, when the wave returns to the base, the basal contact should again show relative negativity. The second and last suppositions are not in accord with the facts. But if, on the other hand, one arranges the potentials theoretically, using the hypothesis of limited potential differences, harmony exists. The hypothesis of limited potential differences, Lewis asserts, is in accord, so far as can be seen, with all present observations on heart muscle.

Roentgenotherapy of Hodgkin's Disease.—The diagnosis of Hodgkin's disease of the mesenteric lymph nodes in the case cited by McAlpin and Von Glahn was made six and one-half years before death. The patient was under observation from the time the diagnosis was made until she died. The temperature at times was of the recurrent type. The blood picture closely resembled that described by Bunting. The blood pressure was very low, even when the patient was first admitted. Although the spleen was thought to be very much enlarged during life, at necropsy it was found to be only a trifle larger than normal. Apparently, a mass of infiltrated fat and intestinal wall had been mistaken for the spleen. Because of the advanced stage of the disease when the diagnosis was made, it is safe to say that the roentgenotherapy slowed the process but in no sense cured the condition. Death was due to perforation of the intestine. This is believed to be very unusual in Hodgkin's disease. Unusual pathologic findings are: extensive involvement of the peritoneum and abdominal viscera; the tendency to regional invasiveness; atypical giant cells and the scarcity of eosinophils.

Experimental Reproduction of Histopathology of Influenza.—Baehr and Loewe describe the pulmonary lesions produced in rabbits by the intratracheal inoculation of Berkefeld filtrates of nasopharyngeal washings from early cases of influenza or of cultures of the filtrable punctiform bodies cultivated from such washings by Loewe and Zeman. These experimental lesions correspond with considerable accuracy to those of human influenza and they cannot be confused with the changes produced by any other pathogenic organism either in human beings or in animals. The unusual nature of the pathologic process in influenza is apparently due to the fact that the virus of this disease possesses a remarkable affinity for the vascular endothelium. The virus gains access via the respiratory passages, and is rapidly absorbed through the mucous membrane of the trachea, bronchi and bronchioles. Apparently, as a result of its peculiar endotheliotoxic property, it then rapidly calls forth a profuse outpouring of serum and red blood cells in patchy areas throughout the lungs. Further evidence of this vascular damage is to be seen in the complete loss of tonus in many capillary loops and in the early occlusion of many capillaries and minute arterioles by blood platelet thrombi.

Bronchospirochetosis in China.—A survey of the Chinese cases of bronchospirochetosis, Faust says, indicates two things. In the first place, a certain proportion of the subjects have pulmonary tuberculosis as a primary infection with a secondary spirochetosis. Secondly, cases of simple bronchospirochetosis are usually of the chronic type, giving a history of recurrent cough and hemoptysis for a period of from one to ten years. In acute bronchospirochetosis, arsenicals injected intravenously, give immediate relief. In tuberculous infections the administration of arsenicals eliminated spirochetes from the sputum but did not materially relieve the patient. The administration of potassium iodid, sodium cacodylate and other therapeutic agents has been found valuable in bronchospirochetosis, but per orem treatments do not have such specific properties as does the intravenous administration of arsenicals.

Acid Base Disturbance in Tetany.—The occurrence of tetany in various disorders of the body is discussed by Grant and six cases of tetany in adults are reported. These are all of the type in which there is an acid base disturbance. Three cases occurred in obstruction of the stomach. In two of these the plasma carbon dioxid capacity was determined, and found greatly increased. In one the blood chlorid was determined and found markedly decreased. Serum calcium, determined in this case, was in the upper limits of normal. These results corroborate in the human the experimental findings of investigators in animals. Two cases resulted from overdosage with sodium bicarbonate, and one occurred in hysterical hyperpnea.

Blood Pressure of Chinese Students.—A study of the blood pressure of 774 health, male, Cantonese youths made by Cadbury shows that their average systolic, diastolic and, to a less degree, pulse pressures, are lower than the standards for European and American youth of corresponding age, weight or height.

Excreting Capacity of Kidney Tissue.—Under certain special conditions, when the amount of secreting tissue in the kidney is constant, Addis says, the amount of urea excreted in the urine in one hour is directly proportional to the amount of urea in 100 c.c. of blood sampled during that period. Under certain special conditions, when the amount of secreting tissue in the kidney varies, the ratio:

$$\frac{\text{urea in one hour's urine}}{\text{urea in 100 c.c. of blood}}$$

is directly proportional to the amount of secreting tissue in the kidney. The conditions under which the ratio:

$$\frac{\text{urea in one hour's urine}}{\text{urea in 100 c.c. of blood}}$$

becomes a measure of the amount of secreting tissue in the kidney are, first, that the urea excreting capacity be placed under a strain so that all the secreting tissue is called to full activity, and second, that there be an absence of the effect of certain specific renal stimulants and depressants.

Glucose Mobilization Rate in Hyperthyroidism.—Ten normal persons and ten subjects with exophthalmic goiter were studied by Sanger and Hun under identical conditions. The blood sugar curves in the control cases were entirely normal, while those in the cases of hyperthyroidism, for the most part, showed the usual variation, i. e., an abnormally high peak maintained over a prolonged period. The respiratory quotients in the normal cases revealed normal carbohydrate storage and response while those in the cases of hyperthyroidism showed a greater and more rapid rise, which made for a striking increase in the carbohydrate utilization.

Boston Medical and Surgical Journal

Sept. 7, 1922, **187**, No. 10

*Blood Changes in Myelogenous Leukemia Following Radium Treatment. B. R. Whitcher, New York.—p. 349.
*Biochemical Studies in Ten Cases of Dementia Praecox. K. M. Bowman, Boston; J. P. Eidson, White Plains, N. Y., and S. P. Burladge, Ithaca, N. Y.—p. 358.

Blood Changes in Myelogenous Leukemia Following Radium Treatment.—Whitcher believes that his case shows that the application of radium in myelogenous leukemia does produce an apparently beneficial effect on the patient, if the amount of radium applied is regulated with caution, as the leukocyte count is reduced to nearly its normal level, the myelocytes are greatly decreased, and at times made to disappear altogether, the blood is brought to a more nearly normal appearance, and an apparent general improvement takes place in the patient's clinical condition. But the treatments needs to be given at regular intervals. On the other hand, the study of Whitcher's case indicates that radium is a factor fraught with danger, and that caution is necessary in regulating the amount to be applied, lest an excessive amount of radium or too frequent application may cause undue destruction of the leukocytes and so injure the reproductive powers of the bone marrow that a rapid leukopenia and anemia result.

Biochemistry of Dementia Praecox.—No constant findings were obtained by Bowman et al. which would serve to explain

dementia praecox on the basis of a simple dysfunction of a single gland. There was found a tendency toward a low basal metabolism and an abnormally sustained blood sugar curve, but such findings were not constant. In no case was there an increased basal metabolism nor was there a subnormal (flat) blood sugar curve.

Colorado Medicine, Denver

September, 1922, **19**, No. 9

Consideration of Migraine Character. J. A. Buchanan, Pueblo.—p. 179.
Motion Study in Surgery. C. S. Elder, Denver.—p. 182.
Intravenous Use of Mercury Cyanid in Treatment of Syphilis. M. Q. Howard, Pueblo.—p. 184.
Contraindication to Use of Quinin and Salicylates in Treatment of Diseases of Middle Ear. C. E. Harner, Denver.—p. 185.
Accuracy in Diagnosis. E. D. Burkhard, Pueblo.—p. 188.

Kansas Medical Society Journal, Topeka

September, 1922, **22**, No. 9

Treatment of Pulmonary Tuberculosis. W. S. Hunter.—p. 263.
Diagnostic Surveys by Diagnostic Commissions for Asylum Populations. C. A. L. Reed, Cincinnati.—p. 267.

Michigan State Medical Society Journal, Grand Rapids

September, 1922, **21**, No. 9

Pathology of Hyperthyroidism. L. B. Wilson, Rochester, Minn.—p. 369.
Hyperthyroidism from Internist's Viewpoint. C. L. Mix, Chicago.—p. 373.
Surgical Aspects of Hyperthyroidism. G. W. Crile, Cleveland.—p. 378.
Radiation Therapy of Hyperthyroidism. W. O. Upson, Battle Creek, Mich.—p. 381.
Prevention of Simple Goiter in Man. O. P. Kimball, Cleveland.—p. 384.
Brain Abscess of Otitic Origin. M. M. Peet, Ann Arbor, Mich.—p. 391.
Labyrinthitis—Secondary to Suppurative Otitis Media. G. E. Frothingham, Detroit.—p. 396.
Protection of Health Through Periodic Medical Examinations. H. Emerson, New York.—p. 399.

Nebraska State Medical Journal, Norfolk

September, 1922, **7**, No. 9

Clinical and Laboratory Facts About Salicylates. S. R. Gifford, Omaha.—p. 293.
Unusual Types and Sequels of Acute Epidemic (Lethargic) Encephalitis. F. E. Coulter, Omaha.—p. 300.
Epidemic Encephalitis in Relation to Anterior Poliomyelitis. F. W. Heagey, Omaha.—p. 304.
Idiopathic Epilepsy. G. A. Birdsall and H. E. Harvey, Fairbury.—p. 312.
Case of Rat Bite Fever. M. Emmert, Omaha.—p. 316.
Diphtheria Following Tonsillectomy. F. L. Secoy, Sioux City, Ia.—p. 318.
Diagnosis and Treatment of Pyelitis. J. M. Mayhew and A. L. Smith, Lincoln.—p. 319.

New York Medical Journal and Medical Record

Sept. 6, 1922, **116**, No. 5

Further Pathologic Studies in Dementia Praecox, Especially in Relation to Interstitial Cells of Leydig. F. W. Mott, London, and M. P. Y. Such, Madrid.—p. 245.
Study of Unconscious Motivations in Suicides. L. P. Clark, New York.—p. 254.
Psychopathologic Disturbances from Avoidance of Parental Responsibility. G. Stragnell, New York.—p. 263.
Folie à Deux. J. H. W. Rhein, Philadelphia.—p. 269.
New Treatment (Endocrine) for Mongolian Idiocy: Brief Review of Symptoms and Signs. W. N. Berkeley, New York.—p. 274.
Tumor of Middle Fossa with Necropsy Findings. E. D. Friedman and B. H. Fairbanks, New York.—p. 275.
Hysteria After Mastoidectomy Simulating Brain Abscess. E. M. Schwartz, New York.—p. 279.
Origin and Scope of Modern State Hospital. C. A. Bonner, Worcester, Mass.—p. 280.
Marked Atrophy in Early Tabes. H. L. Fossey, Philadelphia.—p. 282.

Sept. 20, 1922, **116**, No. 6

Mental Disorders Following Traumatism. A. Gordon, Philadelphia.—p. 305.
General Management of Acute Injuries to Brain. J. H. Baird, New York.—p. 311.
Further Pathologic Studies in Dementia Praecox, Especially in Relation to Interstitial Cells of Leydig. F. W. Mott, London and M. Prados Y. Such, Madrid.—p. 315.
Cerebellar Manifestations of Epidemic Encephalitis. F. W. Heagey, Omaha.—p. 321.
Case of Epidemic Encephalitis with Papilledma Simulating Brain Tumor. S. Naccarati, New York.—p. 326.
*Acute Multiple Sclerosis: An Unusual Case. G. H. Hyslop, New York.—p. 328.
*Case of Dystonia Musculorum with Remarkable Familial History. H. Fossey, Philadelphia.—p. 329.
Endocrine Aspect of Feebleminded and Epileptic Child. H. Goldstein, New York.—p. 330.
Epileptic and Her Sixteen Children. N. S. Yawger, Philadelphia.—p. 334.
Treatment of Epilepsy with Special Reference to Use of Luminal. L. Wender and D. G. Sampson, Corozal, Canal Zone.—p. 336.
Eugenics Versus Epilepsy. J. T. Wright, Skillman, N. J.—p. 339.
Radium in Treatment of Diseases of Women. W. H. B. Aikins, Toronto.—p. 340.

Acute Multiple Sclerosis.—Hyslop reports the case of a man, aged 21, previously in good health, who within thirty months had three episodes suggesting acute cerebellar and pontine lesions. In the intervals he was free of symptoms, except for paresthesia in the hands and a little bladder difficulty. He worked as a laborer. The third episode lasted nearly two months. During the attack, nystagmus, diplopia, vertigo, impaired bladder control, speech difficulty, ataxic gait, bilateral pyramidal tract signs (more on the right) and a left sided diminution of pain and temperature sensibility were noted. These symptoms were the most prominent and persisted longest. The diagnosis in this case lies between tumor of the cerebellum or pons, thrombosis of the posterior inferior cerebellar artery (atypical), angioneurotic edema of the pons and cerebellum, and multiple sclerosis. Multiple sclerosis is the logical diagnosis.

Dystonia Musculorum with Remarkable Familial History.—Fossey's patient was a woman, 29 years of age. Her mother was living and in good health except for blindness due to cataracts. Her father died twenty-one years ago in the insane department of a hospital. An uncle died in a hospital for nervous diseases. An aunt died in the hospital with some "nervous" trouble. An uncle died in the insane department of a hospital. This uncle had four children, cousins of the patient as follows: J., who died in the insane department; L., who was insane at death; W., at present a patient in the insane department of this hospital; G., also a patient in the insane department. The diagnosis of the uncle, of the father, of the cousins W. and G. S., was that of the dementia of late chorea. There was also another patient, a brother of the patient. Thus the patient has six near relatives, including her father, afflicted with Huntington's chorea, and one brother with dystonia.

Oklahoma State Medical Association Journal, Muskogee

August, 1922, **15**, No. 8

Placenta; Management of Third Stage of Labor. J. W. Brown, Tulsa.—p. 239.
History, Examination and Antepartum Care in Pregnancy. D. Lowry, Oklahoma City.—p. 244.
Care of Premature Infants. A. L. Salmon, Oklahoma City.—p. 250.
Puerperal Sepsis. W. A. Fowler, Oklahoma City.—p. 253.
Renal Diabetes. W. H. Bailey, Oklahoma City.—p. 257.
Aberrant Spleen. A. L. Blesh, Oklahoma City.—p. 257.

Public Health Journal, Toronto

August, 1922, **13**, No. 8

Activities of Research Laboratory in Department of Health of Canada. N. MacL. Harris.—p. 337.
Training of Subnormal Children. E. Brison.—p. 345.
Soil Pollution. F. A. Dallyn.—p. 354.
Social Investigation and Follow-Up in Venereal Disease Cases. G. Bates.—p. 362.
Castine Summer School for Rural Leaders. J. Browne.—p. 369.

Southwestern Medicine, Phoenix, Ariz.

August, 1922, **6**, No. 8

Present Aspects of Etiology and Treatment of Bronchial Asthma. G. Piness, Los Angeles.—p. 287.
Treatment of Trachoma. J. D. Mulder, Rehoboth, N. M.—p. 295.
Oxygen and Light in Their Relation to Incidence and Development of Cancer. E. C. Prentiss, El Paso, Tex.—p. 297.
Dietetic Treatment of Diarrhea in Babies. M. K. Wyder, Albuquerque, N. M.—p. 301.
Prostatic Surgery and Some of Its Problems. A. R. Hatcher, Wellington, Kan.—p. 304.
Protein Desensitization and Food Addition Method in Asthma. O. H. Brown, Phoenix, Ariz.—p. 307.

September, 1922, **6**, No. 9

History of Diseases of Thyroid and Development of Its Surgery. E. C. Moore, Los Angeles.—p. 319.
Medicolegal Problems in Arizona. L. R. Anderson, Prescott.—p. 325.
Thoracoplasty in Treatment of Tuberculosis. W. Smith, Phoenix.—p. 334.
Observations from Clinical and Laboratory Findings in Pyelitis and Pyelonephritis. L. J. Roth, Los Angeles.—p. 337.
Experiences in Surgery of Prostate. H. A. Rosenkranz, Los Angeles.—p. 340.

*Ureter Implantation into Groin. H. A. Rosenkrantz, Los Angeles.—p. 343.
Kidney Function. C. S. Vivian, Phoenix.—p. 345.

Implantation of Ureter Into Groin.—In two cases in which one tuberculous kidney had been removed and later tuberculosis developed in the remaining kidney, Rosenkrantz transplanted the ureter of the remaining tuberculous kidney into the groin. These patients wear a soft rubber catheter extending up into the kidney. The catheter empties into a flat bottle attached in front of the pubic or inside the thigh. The patient is instructed how to irrigate his kidney every day or two, and to change his catheter about every three days. Both patients operated on are said to be in perfect health, one two years and the other four years after operation. Rosenkrantz claims for this operation that it is simple; the patient can take care of himself; there is no danger of obstruction to ureter due to adhesions, strictures or plugging with débris; there is immediate and thorough drainage for any infection which may develop; the kidney pelvis is readily accessible to the physician for adjustments, treatment and hygiene; the method is clean and free from leakage; it is a one stage operation; there is no shock; by having the patient's kidney and ureter readily accessible and under control, there is eliminated the chance that makes bowel implantation hazardous; it offers patient the longest tenure of life.

Surgery, Gynecology and Obstetrics, Chicago

September, 1922, **35**, No. 3

Further Notes on Diseases of Umbilicus. T. S. Cullen, Baltimore.—p. 257.
*Combined Transpleural and Transperitoneal Resection of Thoracic Esophagus and Cardia for Carcinoma. C. A. Hedblom, Rochester, Minn.—p. 284.
*Infection in Mediastinum in Fulminating Cases of Empyema. E. K. Dunham, New York.—p. 288.
Roentgent-Ray Diagnosis of More Important Tumors of Long Bones. B. H. Nichols, Cleveland.—p. 301.
Emphysema of Scrotum Result of Diverticulitis of Sigmoid with Perforation. F. W. Rankin and E. S. Judd, Rochester, Minn.—p. 310.
*Posttransfusion Reactions. E. C. Levine and H. N. Segall, Montreal, Can.—p. 313.
*Vomiting and Distention After Laparotomy Lessened by Substitution of Rubber Envelop Pads for Gauze. D. Bissell, New York.—p. 320.
*Cancer in Cervical Stump; Metastasis in Vermiform Appendix. R. T. Frank, Denver.—p. 334.
Associated Pathology of Gall-Bladder Disease with Further Plea for Cholecystectomy. F. D. Moore, Chicago.—p. 338.
Autogenous Versus Heterogenous Bone Pegs. G. de Tarnowsky, Chicago.—p. 342.
*Kineplastic Amputation of Forearm—Trimotor. G. B. Arana, Buenos Aires, Arg.—p. 347.
*Preservation of Motor Root of Gasserian Ganglion During Division of Sensory Root for Trifacial Neuralgia. A. W. Adson, Rochester, Minn.—p. 352.
Case of Primary Carcinoma of Female Urethra Treated with Radium. L. A. Pomeroy and F. W. Milward Cleveland.—p. 355.
Thiersch Graft in Radical Cure of Frontal Sinus and Maxillary Antrum Diseases. J. E. Sheehan, New York.—p. 358.

Resection of Esophagus for Carcinoma.—May 15, 1922, Hedblom resected the thoracic esophagus and the cardia for carcinoma involving both structures. The operation followed a preliminary resection of the fifth to the eleventh ribs and was performed under local anesthesia, and gas and oxygen analgesia. The left plueral cavity and the peritoneal cavity were opened widely, the diaphragm was split down to the hiatus, the esophageal stump was sutured to the skin edges in the middle axillary line, and the gastric stump was brought to the surface near the line. The patient recovered from the operation and is able to take food by mouth through a tube connecting stomata. This is said to be the second reported case in which operation was performed by this method.

Infection in Mediastinum in Empyema.—Figures are presented by Dunham which show that in exactly one quarter of the cases in which death occurred as a result of empyema following influenza during the first two weeks after the incidence of the empyema and in which a necropsy was performed there was an infection in the mediastinum. The proportion falls to a little less than 1 in 15, when the antecedent disease was measles, but shows the same constancy during the first two weeks. The relatively high incidence of mediastinitis in empyema following these two epidemic diseases Dunham believes supports the view that they impair the powers of defense against secondary infections.

Posttransfusion Reactions.—From observations and from an examination of the literature, Levine and Segall have come to the conclusion that inaccurate testing cannot account for all the reactions, but that they occur very frequently, even after the bloods have been properly matched and found suitable. Observations made in three cases cited point to a definite phenomenon, namely, that a long operation in which ether is used as the anesthetic alters the patient's serum as regards its hemoagglutinin properties. Furthermore, this change is not a permanent one but disappears during the first twenty-four hours after the operation, i. e., just about the time when the patient has recovered from the effects of the ether anesthesia. Reactions have also occurred after repeated transfusions. The authors urge, therefore, that the compatibility of the recipient's and donor's bloods must be determined prior to each and every transfusion. No transfusion must be done during or within twenty-four hours after prolonged ether anesthesia even when the donor has been found suitable previous to the beginning of anesthesia. Much depends on the accuracy of the test. It is, therefore, preferable to do both the indirect test (Moss) to determine the group of donor and recipient, and also the direct (Cooca) test, to coroborate the compatibility of the bloods, thus checking up one test by the other.

Prevention of Vomiting and Distention After Laparotomy.—A study was made by Bissell to find out what differences, if any, in postoperative emesis and intestinal distention existed between laparotomized cases in which rubber envelop pads were used and those in which gauze pads were used. In 400 successive laparatomized patients, the use of rubber envelop pads resulted in freedom from vomiting in practically the same proportion as in the nonlaparotomized patients. Comparing nearly equal numbers of laparotomized cases under approximately the same conditions thus, study demonstrates that to substitute the rubber envelop pads for gauze pads is to double the chance of escaping vomiting; to reduce two days vomiting by one third; to cut three days vomiting 60 per cent.; and to lessen distention by two thirds. The dominant factors in the causation of emesis in laparotomized cases, Bissell says, are ether and trauma of the peritoneum of the intestines and while the influence of ether is only twenty-four hours, the influence of intestinal peritoneal trauma may extend to three days or more. Less vomiting, less distention and less morphin shows less trauma to the peritoneum.

Cancer in Cervical Stump.—Frank cites a case in which a supravaginal hysterectomy for fibroids of the uterus had been performed one year before Frank saw the patient and a beginning cancer of the cervix was overlooked. The unique site of metastasis in the vermiform appendix is the main reason for putting the case on record. Secondary cancer of the appendix vermiformis has regularly resulted by continuity from the cecum, or by contiguity when the appendix has become adherent to malignant ovarian or other intraperitoneal neoplasms, or when a diffuse carcinosis of the peritoneum involved the appendix. None of these conditions obtained in Frank's case.

Kineplastic Amputation of Forearm.—Kinematization, or kineplasty, Arana asserts is a procedure which no operative method hitherto known can put into practice. By means of kineplasty there is constructed on the segment of the amputated limb, a kinetic element termed "motor" which has the property of transmitting a living, voluntary, natural force to the respective prothesis and by means of this force the prothesis is endowed with active motion, governed by the patient's will. There are stumps with one motor, unimotor; with two motors, bimotor, and with three motors, trimotor, by means of which an artificial hand may be worked. With three distinct, voluntary forces, independent of each other, the hand is capable of performing varied and even complementary movements resembling those of a normal hand. The reeducation of the disabled is facilitated by using in the construction of the motors, muscles which must continue to work in the fashion intended by nature. In order to bend the fingers of the artificial hand, the patient contracts the same muscles which he used for closing the hand lost by mutila-

tion, and the new adaptation of the motor to the prothesis, will, therefore, be made easy because of its similar function.

Preservation of Motor Root of Gasserian Ganglion During Division.—Adson asserts that it is possible to preserve the motor root of the gasserian ganglion by anatomic dissection without the aid of faradization during the division of the sensory root for trifacial neuralgia. He described the technic employed in nine consecutive cases in which satisfactory results were obtained.

Tennessee State Medical Association Journal, Nashville

August, 1922, **15**, No. 4

Relation of Internist to Diseases of Eye, Ear, Nose and Throat. L. M. Scott, Jellico.—p. 169.
More Conservatism in Medicine and Surgery. V. E. Massey, Huntingdon.—p. 177.
Osteomyelitis. J. P. Baird, Dyersburg.—p. 180.
Diet of Child from Nine to Twenty-Four Months. O. Hill, Knoxville. —p. 185.
Case Report: Syphilitic Cervical Pachymeningitis. R. C. Bunting, Memphis.—p. 188.
Cancer of Lip. C. M. Hamilton, Nashville.—p. 190.
Radium in Cancer. W. S. Anderson, Memphis.—p. 193.
Hematocolpos Complicated with Ovarian Cyst and Appendicitis. W. D. Sumpter, Nashville.—p. 195.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

Aug. 26, 1922, **2**, No. 3217

Plea for Study of Biology in Relation to Public Health. A. K. Chalmers.—p. 333.
Port Sanitary Administration: Development and Relation to Public Health in England and Wales. R. J. Reece.—p. 335.
Economics of Public Health. F. E. Fremantle.—p. 338.
Interpretation of Death Statistics of Infancy and Childhood in Relation to Development and Environment. J. Brownlee.—p. 342.
*Puerperal Mortality in Scotland. T. F. Dewar.—p. 344.
*Defects in School Children. R. Bruce.—p. 346.
Maternity and Child Welfare in Scotland. M. J. Menzies.—p. 348.
Industrial Fatigue and Vocational Selection on Basis of Physical Inquiry. D. McKail.—p. 351.
Constituents of Fresh and Vitiated Air and Their Significance in Problems of Ventilation. J. P. Kinloch.—p. 356.
Wrong Turning in Public Health. F. E. Wynne.—p. 357.
Methods of Sewage Disposal in Tropics: Special Reference to Helminth Infection. M. Khalil.—p. 360.
Should We Longer Tolerate the Pollution of the Air? B. W. B. Smith. —p. 361.
Training for the D. P. J. and New Regulations. E. W. Hope.—p. 363.
Administrative Requirements of Various Types of Tuberculosis. A. S. M. MacGregor.—p. 365.
Importance of Teaching Medical Jurisprudence to Students of Medicine and Law. A. Allison.—p. 368.
Dangers to Health Arising from Use of Industrial Preparations of Arsenic. W. H. Willcox.—p. 371.

Sept. 2, 1922, **2**, No. 3218

Training of the Medical Student. C. Allbutt.—p. 407.
Place of Pharmacology in the Medical Curriculum. W. E. Dixon.—p. 410.

Puerperal Mortality in Scotland.—In Scotland, for 1919, the total death rate from puerperal conditions per thousand births was 6.21. That proportion is maintained with approximate equality in the various parts of the country. For the larger burghs it is 6.4, for the smaller burghs it is 5.9 and for the country districts it is 6.2. Among the cities and large burghs it ranged, in that year, from 4.6 in Paisley to 8.2 in Edinburgh. These figures deal with the total puerperal death rate; septic conditions accounted for 23 per cent. of the whole. In the city of Aberdeen since the beginning of 1917 a full inquiry has been made by Dewar, so far as practicable, regarding every death of a woman occurring within four weeks of confinement. During the five years in which such inquiry has been made, the total puerperal death rate and the septic puerperal death rate, per thousand births, have been respectively as follows:

Year	Total Puerperal Death Rate per 1,000 Births	Puerperal Sepsis Death Rate per 1,000 Births
1917	9.8	2.7
1918	7.9	2.1
1919	6.7	0.3
1920	6.0	1.0
1921	6.0	1.4

Defects in Schoolchildren.—At 5 years of age 58 per cent. of the crippling found by Bruce to exist in 15,605 schoolchildren was due to rickets, and to rickets of the most pronounced type. The next most frequent cause of crippling, he says, is tuberculosis, which caused 9 per cent. of the total crippling. Pulmonary tuberculosis is conspicuous by its absence. Routine medical inspection revealed no evidence of definite pulmonary tuberculosis and only seven suspected cases out of a total of 15,605 children examined. Chronic bronchitis is responsible for 6 per cent. of the whole crippling. Nervous diseases are responsible for 7.4 per cent. of the crippling found at this age. Mental deficiency comes next in the order of frequency, with a total percentage of 6.3. The cases of anemia and malnutrition, which account for 3.9 per cent. of the total crippling, are those which show no symptoms of other disease, debilitated conditions usually following on pneumonia or one of the infective fevers. In some of the cases a tuberculous family history can be elicited. The remaining 9 per cent. of crippling were due to eye conditions, mostly strumous ophthalmia, a few cases of heart disease—the acquired of those due to scarlet fever and rheumatism—and other miscellaneous conditions such as congenital and acquired deformities.

Indian Journal of Medical Research, Calcutta

July, 1922, **10**, No. 1

Bacteriologic and Laboratory Technic. W. F. Harvey.—p. 1.
Occurrence of Larvae of Philematomyia Crassirostris Stein in Human Intestine. W. S. Patton.—p. 57.
Two Cases of Cutaneous Myiasis Caused by Larvae of Sarcophaga Sp.? W. S. Patton.—p. 60.
Egg Laying Habits of Cobboldia Elephantis Cobbold. W. S. Patton.—p. 63.
Value of Tame Cow for Collecting Blood-Sucking Diptera of Locality. W. S. Patton.—p. 66.
New Indian Species of Genus Musca. W. S. Patton.—p. 69.
Relapsing Fever in United Provinces of Agra and Oudh. F. W. Cragg. —p. 78.
Retention of Virulence of Micro-Organism Kept in Sealed Culture. W. F. Harvey and K. R. K. Iyengar.—p. 190.
Influence of Age and Temperature on Bacterial Vaccines. W. F. Harvey and K. R. K. Iyengar.—p. 192.
*Simplified Method for Cultivation of Plasmodium Falciparum in Vitro. J. A. Sinton.—p. 203.
Further Remarks on Clinical Method for Cultivation of Subtertian Malaria Parasite in Vitro with Note on Its Use in Diagnosis. J. A. Sinton.—p. 210.
*Case of Malaria Due to Plasmodium Tenue (Stephens). J. A. Sinton. —p. 215.
Bodies Observed in Cimex Rotundatus Linne Collected in Kala-Azar Infected Area in Assam. H. A. Adie.—p. 236.
*New Variety of Streptothrix Cultivated from Mycetoma of Leg. J. W. Cornwall and H. M. Lafrenais.—p. 239.
Synopsis of Adult Oriental Culicine (Including Megarhinine and Sabethine) Mosquitoes. F. W. Edwards.—p. 249.

Cultivation of Plasmodium Falciparum.—Sinton uses a medium consisting of ascitic or hydrocele fluid to which dextrose is added, and a special culture tube in which a few drops of blood from the finger of a malarial patient can be taken, defibrinated and cultured without any transference being necessary.

Malaria Due to Plasmodium Tenue.—Sinton has seen five cases of malaria due to *Plasmodium tenue*. He describes and pictures the organism in detail.

New Streptothrix from Mycetoma Lesion.—The organism described by Cornwall and Lafrenais, according to the Society of American Bacteriologists should be termed an "actinomyces," whereas according to Chalmers and his collaborators it should be "nocardia." Its morphology and biology are described.

Journal of State Medicine, London

August, 1922, **30**, No. 8

Points of Interest Respecting Preserved Food, More Particularly that Supplied to Fleet. T. J. Underhill.—p. 336.
Climate of Plymouth and Its Relation to Public Health. H. V. Prigg. —p. 356.

Journal of Tropical Medicine and Hygiene, London

Aug. 15, 1922, **25**, No. 16

Preventive Aspects of Endemics in Modern Times. W. J. Simpson.—p. 257.
Passages of Medical Interest from West Indian Note-Books of Dr. Louis Westenra Sambon. B. Dwellings.—p. 260.

Lancet, London

Aug. 26, 1922, **2**, No. 5165

Students' Guide—Session 1922-1923.—p. 425.

Sept. 2, 1922, **2**, No. 5166

Ambulatory Treatment of Fracture of Limbs; Tuberculous and Arthritic Disease of Joints. C. A. Hoefticke.—p. 492.
*Treatment of Acute Pneumonia and Influenzal Bronchopneumonia. W. H. Wynn.—p. 493.
Malnutrition, or Infantile Dystrophies. C. Chisholm.—p. 497.
Blood Transfusion: Automatic Method of Citration at Body Temperature. W. B. Bell.—p. 501.
*Old Age and Blood Pressure Problems. R. J. C. Thompson and R. E. Todd.—p. 501.
Heterophyes Nocens: Distinct Species of Trematode Parasite. C. Lane.—p. 505.
*Priapism: Complicating Myelogenous Leukemia and Noted as First Symptom. G. W. Theobald.—p. 505.
Case of Impaction of Pharynx by Watch. P. E. Hill.—p. 508.
Unusual Local Effect (Skin Eruption) of Novarsenobillon. M. O'B. Beadon.—p. 508.

Treatment of Pneumonia.—Alcohol, Wynn says, is the most used of all drugs in pneumonia and influenza, and has the sanction of some distinguished authorities. There is no scientific reason for its use, which is mainly based on tradition and the popular idea that it is a stimulant. Apart from its very fleeting stimulating effect, produced reflexly by the irritation of mucous membranes, its chief actions are to depress the nervous system and to inhibit antibody formation, neither of which is desirable in diseases whose toxins are also nerve depressants. The clinical experience cited in its favor is met with equally distinguished evidence against it. The high mortality of pneumonia and bronchopneumonia will never be reduced by attempts to treat poisoned organs incapable of response, but by early diagnosis and prompt measures to prevent intoxication by immediate specific treatment and common sense nursing. Expectant treatment in the early stages is often followed by harmful drugging in the later. Wynn favors vaccine treatment. He uses a vaccine made from primary cultures or at most first subcultures. It should not be detoxicated or sensitized. For acute pneumonia the vaccine contains several strains of pneumococci, and for influenzal bronchopneumonia equal numbers of pneumococci, streptococci, and influenza bacilli. The important points are that it should be given early and in sufficient amount. In pneumonia Wynn gives 100 millions pneumococci to an adult and in influenzal bronchopneumonia 100 millions of each organism. For a child, aged 12 or 14, from 40 to 50 millions should be given, and to a child of 2 or 3, 10 to 20 millions. The only death among fifty-one patients injected within the first two days of their illness occurred in a young woman who was admitted on the second day with violent mania and extensive bronchopneumonia. Seven out of the ten deaths occurred in patients who were not injected until the fourth or fifth day. Four of these cases were complicated, respectively, by mitral stenosis, advanced pregnancy, meningitis and asthma, and in three other cases there was a considerable albuminuria. The ten deaths give a mortality rate of 9.1 per cent.

Blood Pressure in the Aged.—The net result of Thompson and Todd's clinical blood pressure observations on very old people is that the readings are more of theoretical interest than useful in diagnosis or treatment. A man over 80 with no subjective or objective signs whose mechanism has become adapted to a $\frac{200}{100}$ pressure is not a case of hypertension to be dosed with iodids and nitrites, to be carefully dieted and subjected to balneotherapy. His medical attendant may be thankful that the man has been fitted with what is probably a compensatory and beneficent high systolic pressure. He will be wise in not tampering with the individual in order to treat a diagnosis. We submit that his, or her, the authors emphasize, high or low blood pressure is not a subject to be discussed with the patient either directly or by suggestion. There are already too may people who quote their blood pressure figures. It is enough that such people regard their "nerves" and intimacies of metabolism as topics of general conversational interest. Freedom from anxiety, business, domestic and personal, is therapeutically most important for the subject of the hypertension which requires treatment. Patients who brood over their own blood pressure figures, or the fact that their doctor has told them that they "suffer from high blood pressure," are very prone to become the subjects of a vicious circle in which the processes revolve the faster the more introspective the patient becomes.

Priapism in Myelogenous Leukemia.—Priapism constituted the first symptom of myelogenous leukemia in Theobald's case. The patient, aged 31, never complained of bleeding from his nose or gums, nor was blood visible in his stools. The blood count was high, 1,020,000 leukocytes in 1 c.mm. of blood.

Medical Journal of Australia, Sydney

July 22, 1922, **2**, No. 4

Development of Human Dental Mechanism; Significance of Deciduous Teeth; Orthodontia as Aid to Pediatrics. W. S. Wilkinson.—p. 83.
Management of Diabetes Mellitus of Children. H. B. Graham.—p. 89.
Diphtheritic Vulvitis. F. A. Maguire.—p. 94.

July 29, 1922, **2**, No. 5

*Prognosis of Lobar Pneumonia and Influence of Serum in Treatment. S. W. Patterson.—p. 115.
*Action of Pneumococcus on Aromatic Amino-Bodies. W. J. Penfold.—p. 120.
*Case of Acute Syphilis of Central Nervous System. I. Morgan.—p. 129.

Serum Therapy of Lobar Pneumonia.—Sixty-six patients in the Melbourne Hospital series were treated with antipneumococcal serum, either polyvalent or monovalent. As a rule, serum was given only to patients who were severely ill or who were doing badly and for that reason was often given late in the disease. Thus three patients received serum only on the day before their death, which occurred on the tenth, eleventh and eighteenth day, respectively. Twelve other patients, of whom three died, may be excluded because serum was given in small doses and especially small single doses of from 5 to 10 c.c. subcutaneously. This leaves fifty-one patients treated with polyvalent or monovalent (Type I) serum administered subcutaneously or intravenously or both ways with eight deaths, i. e., a mortality of 15.7 per cent. Patterson is of the opinion that these figures are sufficiently striking to warrant a wider use of serum.

Action of Pneumococcus on Aromatic Amins.—All pneumococci and probably all streptococci, Penfold asserts, act on certain aromatic amins, notably, anilin, benzidin and the toluidins, producing pigment. The pigments are probably due to the oxidation of the amino bodies by the peroxid produced by these organisms. This anilin pigment production serves to separate the pneumococcus and streptococcus from the great majority of pathogenic organisms and may possibly be profitably applied in field work for the detection of both the anilin pigment forming and the anilin nonpigment forming bacteria. Benzidin is the best of the aromatic amins for the purposes of this test. Eighteen c.c. of nutrient agar, 1 c.c. of citrated horse blood and 1 c.c. of 0.5 per cent. benzidin solution constitute an excellent medium for obtaining this reaction.

Acute Syphilis of Central Nervous System.—Morgan's patient, aged 21, suddenly developed severe headache and double facial palsy. He vomited for three days. He became drowsy and "slept practically all the time, as if in a stupor." His pupils reacted to light and accommodation fairly well. The knee jerks were very feeble. A provisional diagnosis was made of (1) cerebral abscess, (2) syphilis of the central nervous system, (3) lethargic encephalitis. The patient rapidly became cyanosed and died on the third morning after admission of what seemed like a paralysis of the respiratory center. At the necropsy marked early atheroma was seen of the aortic wall just above the situation of the aortic valves. The presence of aortitis in a man, aged 21, strongly positive Wassermann reaction of the cerebrospinal fluid and the obvious infection of the central nervous system led to the diagnosis of acute syphilis of the central nervous system. No other pathologic lesion could be found. Morgan concludes that death was cause by the toxins of *Treponema pallida*.

South African Medical Record, Cape Town

Aug. 12, 1922, **20**, No. 15

Simple Device for Collecting Blood for Transmission to Laboratory at Distance for Subsequent Estimation. F. H. Joseph.—p. 282.

Archives des Maladies du Cœur, Etc., Paris

July, 1922, **15**, No. 7

*Forms of Gallop Rhythm. L. Bard.—p. 457.
*Aneurysm of Pulmonary Artery. G. Blechmann and A. Paulin.—p. 472.
*Pernicious Anemia. A. Thomas and G. Poix.—p. 481.
*Spread of Mitral Murmur. G. Turrettini.—p. 489.
*Comparative Blood Pressure in Arms and Legs. A. Dumas.—p. 495.

Forms of Gallop Rhythm.—Bard discusses gallop rhythm in relation to its synchronism. There are three forms of the gallop rhythm; protosystolic, presystolic and protodiastolic. They are all connected with the pathologic forms of the diastolic filling of the ventricles. On the other hand, they have no relation to the conditions controlling the period of evacuation.

Aneurysm of Pulmonary Artery.—Blechmann and Paulin publish what they believe to be the first observation of an aneurysm of the pulmonary artery in a child. It was due to acute endocarditis implanted on a congenital cardiopathy.

Pernicious Anemia.—Thomas and Poix publish a case of pernicious anemia with subacute evolution revealed by an ataxoparaplegic syndrome with rapid onset.

Mitral Insufficiency Murmur.—Turrettini reports three cases of the mitral insufficiency murmur spreading over the whole thorax and along the spine. Radioscopy in the oblique position revealed the close proximity of the posterior part of the heart to the vertebrae.

Comparative Blood Pressure in Arms and Legs.—Dumas' research was made in forty cases of high blood pressure in both sexes. In thirty-four the tension was higher in the legs than in the arms. Dumas asserts that this higher blood pressure and more pronounced oscillographic findings in the legs, in comparison to the arms, is an early sign of weakening of the heart.

Bulletin de l'Académie de Médecine, Paris

July 18, 1922, **88**, No. 29

*Undernourished Children. Méry.—p. 47.
Pregnancy and Tuberculosis. E. Sergent.—p. 50.
Variations in Prevalence of Scabies. G. Thibierge.—p. 52.
Means to Reduce Traffic in Cocain. Courtois-Suffit and R. Giroux.—p. 65.
Occupational Affection Due to Coleoptera. A. Loir and H. Legangneux.—p. 68.
Rural Welfare Center for Infants. R. Dubost, G. Blechmann and François.—p. 72.
*Aids to Gastric Digestion. F. Ramond.—p. 76.

Undernourished Children.—Méry comments on a recent study of the physical development of schoolchildren during the years of the war and since. He reiterates the conclusion that abundance of milk is indispensable for children who for any reason have had their growth retarded.

Aids to Gastric Digestion.—Ramond reports that addition of calcium chlorid or magnesium chlorid hastens artificial digestion of gelatin in the test tube. Phosphates retard it. Hence the chlorids may be found useful when gastric digestion is insufficient, while the phosphates may be indicated with excessive gastric secretion.

Bulletins de la Société Médicale des Hôpitaux, Paris

July 7, 1922, **46**, No. 24

Vaccine Therapy in Malta Fever. N. Fiessinger and G. Blum.—p. 1040.
*Paratyphoid Bacilli in Pneumonia. A. Lemierre and L. Lévesque.—p. 1045. Idem. Loeper and Marchal.—p. 1053.
*Acute Articular Typhoid. J. Thiroloix and Harmelin.—p. 1054.
*Ouabain in Heart Disease. C. Laubry and C. Pezzi.—p. 1061.
*Complications of Chronic Malaria. C. I. Urechia.—p. 1070.
*Autohypnosis. C. I. Urechia and N. Rusdea.—p. 1073.
Respiratory Disturbances in Epidemic Encephalitis. P. Marie, L. Binet and G. Lévy.—p. 1075.
Epidemic Erythema Nodosum. G. Caussade et al.—p. 1080.
*Radiotherapy of Lung Tumor. J. Thiroloix and Pierquin.—p. 1086.
Ascites Rupturing Umbilicus. Lemierre and Lévesque.—p. 1091.
*Digestive Hemoclasis in Leukemia. Dumitresco-Mante.—p. 1097.

Paratyphoid Bacilli in Blood in Pneumonia.—In the case reported by Lemierre, the paratyphoid B bacillus was cultivated from the blood the eighth day of pneumonia with pneumococci swarming in sputum. There was nothing to suggest that the paratyphoid bacillus was more than a casual saprophyte. Loeper reports a similar case.

Acute Articular Typhoid.—Necropsy failed to confirm the diagnosis of acute articular rheumatism made at first. The findings indicated typhoid septicemia of the "arthrotyphoid" type, with multiple hemorrhages. The onset had been with pains and effusion in the ankles and some of the joints in the feet, following an injury from a plank that had fallen on the feet the day before. The knees soon became swollen and painful. Treatment was with the salicylates at first, and then measures to control the hemorrhagic tendency. The typhoid bacillus was not found in the blood till the end of the third week, and the exsanguinated young man died in two months.

Ouabain in Heart Disease.—Laubry and Pezzi review their extensive experience with ouabain by the vein in more than five years. They discuss the indications for it, and describe three typical cases to show the valuable aid possible from this drug when all others have exhausted their usefulness. They reiterate that its field is only after the failure of others. After a course of ouabain, digitalis may regain its efficacy. In the discussion that followed, Fiessinger emphasized the surprising reactivation of digitalis that may occur when the digitalis is given by the vein after it has exhausted its usefulness by the mouth. It can be resumed later by the mouth with good effect.

Complications of Chronic Malaria.—In the case reported, multiple polyneuritis and paralysis were accompanied by transient mental confusion. Recovery followed quinin plus arsphenamin treatment.

Autohypnosis. — Urechia and Rusdea injected sodium cacodylate in a young man presenting what seemed to be a case of catatonia. Cocain had no influence on it, but the pain from the injections of the drug roused him from his trance, and a complete cure followed. The retrospective diagnosis was autohypnosis. The youth of 17 was a musician, and had been interested in hypnosis. He practiced it on his mates, and finally on himself as he stood in front of a mirror. The autohypnosis thus induced he was unable to throw off. The family and clinic, not knowing this, treated him on a mistaken basis until he was gradually recalled to normal by the pain from the five injections.

Lung Tumor Subsides Under Radiotherapy.—During the first phase the tumor in the hilum of the lung seemed to be an ordinary tuberculous process. After eight months of this, recurring hemoptysis and a rebellious cough were explained by the shadow of a tumor. The woman felt better for some time after the two roentgenoscopic examinations. This suggested that the tumor was exceptionally sensitive to the roentgen rays, and under deep roentgen-ray treatment the whole clinical picture subsided, and the lung shadow cleared up. The cross-fire roentgenization totaled nearly fifteen hours, in three weeks, with a 30 cm. spark; 12 mm. aluminum filter; 35 cm. distance; fifteen sittings.

Liver Insufficiency in Leukemia.—Mante found the hemoclastic crisis pronounced in four cases of leukemia.

Journal d'Urologie, Paris

July, 1922, **14**, No. 1

*Nephrectomies Based on the Ambard Index. J. Quénu.—p. 1.
Urethrocele in Women. Villemin.—p. 27.

Nephrectomies on Basis of Ambard's Formula.—Quénu relates that Legueu has done nephrectomy in 263 cases on the basis of the Ambard ureosecretory constant, without catheterization of the ureters. The outcome was the same or a trifle better than in a previous series of nephrectomies preceded by catheterizing the ureters: 3.8 per cent. of 367 with catheterization and 3.4 per cent. of 263 without. When the Ambard constant was below 0.100, the mortality was 3.6, while it was 10 per cent. in those with a constant above 0.100. The constant is an index of secretory conditions at the moment, and thus it varies from time to time. With renal tuberculosis conditions may improve so much under the influence of dieting or of a nephrostomy or simply under the influence of time so that the Ambard index may drop to normal range. This drop may be due to subsidence of the nephritis element or to compensating hypertrophy in the least pathologic kidney. Whatever the cause, the index drops enough to bring the case into the operable group. The

excellent results in certain cases of renal tuberculosis with a high constant can be explained by assuming that the constant expressed not only the definite destructive lesions but also some transient inflammatory lesions, which subsided later. There is also a possibility that the lesions in the kidney that was removed had been maintaining the nephritis in the other kidney. This assumption is sustained by the progressive improvement in the index, paralleling the improvement in the general health after the nephrectomy. Consequently it is difficult to say what figure must be accepted as the limit for possible operative intervention. Some tuberculous cases proved successful with a constant of 0.122 up to 0.151; with hydronephrosis, of 0.140 up to 0.196; with a calculus, of 0.200, and in one fistula case, with an index of 0.204. But in all these cases the kidney that was removed had lost all secreting power. Its removal could not affect the total of renal functioning any more than the removal of a lipoma on the thigh.

Néoplasmes, Paris

May 15, 1922, **1**, No. 3

Leukocytes in Blood of Cancer Subjects. A. Robin.—p. 81.
*Radiotherapy. C. Schmitt.—p. 94. Conc'n.
*Origin and Genesis of Cancer. L. Bard.—p. 98.

Dangers of Radiotherapy for the Patient.—Schmitt has been analyzing the mishaps attributed to roentgen and radium rays. His conclusion is that in the majority of cases the progress of the disease, and not the irradiation, was responsible for the fistula or other mishap. The inadequacy of the treatment, not the treatment itself, must be incriminated. A febrile reaction with vomiting and headache may be observed from resorption of the disintegrated cancer masses, but this is another matter.

Origin of Cancer.—The editors of *Néoplasmes* appealed to their readers to send in a thirty-line summary of their views on the origin of cancer. Bard's article is the first response to be published. He recalls that as cancer does not seem to be limited to any special type of cells, any explanation of its origin must apply equally well to all kinds of tissues. His view is that some cell is born which lacks the receiving apparatus for the moderating influence exerted normally by the organism on cell proliferation. This cell and its descendants develop without regard to the rest of the organism, leading an anarchistic and parasitic existence. Malignant disease is thus a form of cell teratology.

Paris Médical

Aug. 12, 1922, **12**, No. 32

*Devices for Osteosynthesis. J. Tourneix.—p. 149.
Tin in Treatment of Staphylococcus Infection. H. Drouin.—p. 152.
Progressive Intratracheal Injections. G. Rosenthal.—p. 155.
Advantages of Deep Breathing Exercises. Joland.—p. 157.
*Ameba-Spirillum Dysentery. J. Dumont.—p. 161.

Improved Devices for Osteosynthesis.—Tourneix gives an illustrated description of instruments to apply force in buckling a metal band in reconstruction of the shaft of a fractured bone.

Ameba-Spirillum Dysentery.—Dumont has isolated a spirillum in cases of amebic dysentery, and he is inclined to attribute the tenacious persistence of the dysentery to this secondary infection in many cases. The dysentery is refractory to emetin in such cases. In one of two cases described, treatment with neo-arsphenamin was followed by recovery, bowel conditions returning to normal after two years of recurring dysentery. In another case the recurring dysentery seemed to be the work of the spirilla alone; no amebas were ever found on repeated examination. The patient was clinically cured by arsenical treatment, although in this and in the preceding case the spirilla were still numerous in the stools after recovery.

Presse Médicale, Paris

Aug. 5, 1922, **30**, No. 62

*Eserin Test of Vegetative Nervous System. D. Daniélopolu and A. Carniol.—p. 665.
*The Heart with High Blood Pressure. E. Donzelot.—p. 667.
*Eruptions Under Arsenicals. Desaux et al.—p. 668.
*Micro-Organisms in Stools of Diabetics. P. Pagniez.—p. 669.

Action of Physostigmin on Vegetative Nervous System.—This communication presents evidence that physostigmin acts on the entire vegetative nervous system and not on the vagus alone. Besides vagotonia and sympatheticotonia, there may be amphotonia, that is, of both vagus and sympathetic at once. Each gets the predominance at times and loses it again, so the functioning of the organs involved is extremely variable. This is especially noticeable in the heart action, and the test injection of 1 mg. of physostigmin throws light on various physiologic phenomena, the nature of muscular contraction, the effect of certain drugs, etc.

The Heart with Permanently High Blood Pressure.—Donzelot explains that the clinical picture which we are liable to label "mitral endocarditis with insufficiency of the right heart" may be in reality merely the effect on the heart of chronic hypertension and developing sclerosis. The exaggeration of the second aorta sound and the hypertrophy of the left ventricle testify to the permanent hypertension. This entails sclerosis in arteries, kidneys and heart, and treatment must aim to relieve these organs, and sustain in particular the relaxed myocardium, and combat the arrhythmia. This "camouflaged heart of hypertension" is the indication almost *par excellence*, he says, for ouabain. This tones up the heart, and then digitalis reenforces its action and tends to regulate the heart rhythm. Strict repose should be enforced, and only milk allowed, up to 1.5 liter. Quinidin is contraindicated on account of its depressing action on the myocardium.

Eruptions During Arsenical Treatment.—In six of ten cases of this kind, insufficiency of the liver was evident, and urobilinuria was pronounced in two of the others.

Micro-Organisms in Stools of Diabetics.—Pagniez relates that Berthelot has isolated from soil, manure, etc., 56 varieties of micro-organisms which produce acetone in attacking carbohydrates, but only 3 of them produced acetone in any appreciable amounts. No species producing acetone from starch were found in the stools of 32 normal subjects while acetone-producing micro-organisms were present in the stools of 17 out of 22 diabetics examined. Berthelot's further research demonstrated that rabbits fed mainly with carbohydrates and given daily a quantity of an acetone-producing micro-organism in the food, developed persisting glycosuria and a certain degree of acidosis. One rabbit ingesting the *microbe acétonogène* had a 7 gm. glycosuria by the twentieth day, and this has persisted for more than five months to date, with diaceturia; on one occasion acetonuria was found. These experiences and Renshaw's *Bacillus amyloclasticus*, which he reports finding in the stools of diabetics, are interesting to compare with the results of the research of others who succeeded in inducing diabetes in dogs and cats by feeding bacilli cultivated from the stools of diabetic patients. They bring up the old question of the possible microbian origin of diabetes.

Aug. 12, 1922, **30**, No. 64

*Chronic Cholecystitis. M. Chiray and G. Semelaigne.—p. 685.
*Obesity and Abnormal Leanness. Prével.—p. 688.
*Gastric and Duodenal Ulcer. L. Cheinisse.—p. 690.

Chronic Cholecystitis Without Gallstones.—All the evidence presented testifies that a chronically inflamed gallbladder should be removed as the routine procedure, regardless of whether or not there are gallstones.

Obesity and Abnormal Leanness.—Prével declares that most cases of obesity or leanness are due to an upset between the digestive functions—the receiving apparatus—and the respiratory and muscular functions—the disbursing apparatus. He explains that the liver and the lungs are the most active organs in the metabolism of fats. Analysis of 180 subjects has demonstrated by the general shape of the body and the laboratory and clinical findings that the respiratory function plays an important part, if not the preponderant one, in the regulation of the reserves of fat.

Gastric and Duodenal Ulcer.—Cheinisse reviews the papers and discussion of this subject at the recent annual session of the American Medical Association.

Aug. 16, 1922, **30**, No. 65

*Typhoid Perforations. Klippel and A. Feil.—p. 697.
Sacralization of Lumbar Vertebra. A. Zimmern et al.—p. 698.
Traumatic Pseudocysts of the Pancreas. R. Bonneau.—p. 701.

Aug. 19, 1922, **30**, No. 66

The Micro-Organism of Typhus. L. Nattan-Larrier.—p. 709.
Present Status of Measles. P. L. Marie.—p. 711.

Spontaneous Healing of Typhoid Perforations.—Klippel and Feil report a case of spontaneous healing of a typhoid perforation found at necropsy of a woman who had succumbed to pulmonary complications of the typhoid after symptoms indicating perforation seven days before. The rapid subsidence of the signs of peritonitis had suggested that the diagnosis of perforation had been a mistake, until necropsy disclosed the fibrinous deposit on the bowel, closing the small perforation in the center of a Peyer patch. Hartmann and Bucquoy have reported cases in which the peritonitis from a typhoid perforation had become encysted, with recovery.

Progrès Médical, Paris

Aug. 12, 1922, **37**, No. 32

Cytologic Examination of Stomach Content. M. Loeper and G. Marchal.—p. 373.
*Fourth Venereal Disease. L. Bory.—p. 373.
Autoserotherapy in Spasmodic Rhinitis. R. Landrieu.—p. 377.
Radium Therapy and Deep Roentgenotherapy in Rectum, Prostate and Bladder Cancers. R. Proust.—p. 378.
Syphilis in Relation to Diabetes. C. Pfeiffer.—p. 381.

Fourth Venereal Disease.—Bory comments on the number of new terms applied to this venereal disease, and states that a proper name for it has not yet been found. It was called by Nélaton "subacute adenitis with intraglandular purulent foci," which is the most fitting term for it so far. Clinically, it has been isolated from tuberculosis, syphilis and soft chancre, for which it is still sometimes mistaken, notwithstanding the absence of their specific germs. In supposing even that it was due to Ducrey's bacillus—although it has never been found—the duration of incubation would upset this hypothesis as the disease is contagious, and its incubation varies between ten and thirty days. The only affection impossible to differentiate from this fourth venereal disease is the tropical bubo, and the reason for this is that it is one and the same affection. If the *micro-chancre poradénique*, as Bory proposes to call it, constitutes a real morbid entity, different from any other venereal disease, its primary cause is yet unknown. Radiotherapy has given good results, especially at the onset; during the fistulous period the result is dubious. Ravaut found emetin by the vein effectual, but it failed with others. Bory extols excision or ignicauterization of the microchancre, and injection in the gland or abscesses of a few drops to 2 or 3 c.c. of iodized or iodoform oil (1 per cent. of iodin or iodoform to 10 per cent. xylene and 90 per cent. liquid petrolatum), repeating the instillation every two or three days. This method was effectual without general treatment. Immunity is not conferred by previous infection.

Revue de Chirurgie, Paris

1922, **60**, No. 4

*Grafts of Bone Tissue. R. Simon.—p. 207. Cont'd.

Grafts of Bone Tissue.—Simon's biologic research on bone grafts was done under Sencert's guidance. The experiments were made with living and dead grafts, and he reviews 147 cases published by different writers.

Revue de Médecine, Paris

June, 1922, **39**, No. 6

*False Pneumothorax. L. Caussade and E. Abel.—p. 321.
The Urine in Malaria. R. Chambelland.—p. 349.
Chronic Psychomotor Hallucinations. R. Benon.—p. 357.
Present Status of Treatment of Tuberculosis. H. Godlewski.—p. 368.

False Pneumothorax.—Among the cases described by Caussade and Abel is one in which diaphragmatic hernia induced symptoms simulating pneumothorax. In another case the whole set of symptoms had been induced by extreme distention of one loop of the colon. In another case pleurisy plus tympanism was responsible for the blunder in diagnosis, and in another case a hydropneumothorax. In some other cases pleurisy or pneumonia had induced the symptoms of pneumothorax. There is no pathognomonic symptom of pneumothorax, and before accepting it, all the organs in the vicinity should be examined for conditions inducing a false pneumothorax.

Revue Franç. de Gynécologie et d'Obstét., Paris

June, 1922, **17**, No. 6

*Conservative Cesarean Section. V. Cathala.—p. 321.
*Examination Through the Rectum. A. Perrola.—p. 330.

Conservative Cesarean Section.—Cathala asks whether the advantages of drawing out the uterus before making the incision for cesarean section counterbalance the drawbacks of this exteriorization. He proceeds to present arguments which denounce it as unnecessarily complicating the operation. It compels an incision nearly twice as long as when no attempt is made to draw out the uterus. It is allowable only when the amniotic fluid is suspected of being infected, and in this case the uterus is drawn out merely as the prelude to hysterectomy.

Examination of the Pregnant Through the Rectum.—Perrola writes from the gynecologic and obstetric clinic at Geneva in charge of Beuttner to extol the value of *le toucher rectal*. In 100 maternity cases in which no internal examination was made, only 16 per cent. had any temperature above normal in the twelve days following delivery; 21 per cent. of 100 others examined only through the rectum, and 22 per cent. of 100 given vaginal examination. The morbidity rate is thus about the same, but the temperature averaged much higher in the vagina cases. Interpretation of the findings of palpation through the rectum may sometimes be difficult, but practice will aid in this. One great advantage of rectal palpation is that it can be frequently repeated without harm, and medical and midwifery students should be thoroughly trained in it. Everything learned in this way is a help toward vaginal examination, if this finally becomes necessary. Folds in the rectal mucosa may prove misleading when the cervix is either still tightly closed or is wide open. In only 10 per cent. of his 100 cases was there any doubt in this line. In thirty-five cases the position of the head was dubious, and in 10 per cent. the deductions were incorrect. In 2 per cent. the head was mistaken for the breech. With a contracted pelvis, the diagonal conjugate can be measured through the rectum, deducting 1 or 1.5 cm. for the thickness of the perineum between the exploring finger and the vagina. None of his patients objected seriously to the rectal procedure, but some thought the explorer had mistaken the rectum for the vagina. He advocates rectal examination always to start with, at least, if examination is necessary.

Revue Médicale de la Suisse Romande, Geneva

July, 1922, **42**, No. 7

*Tuberculosis and Articular Rheumatism. N. Betchov.—p. 417.
Sodium Sulphate in Decoloration of Tubercle Bacilli. Bergen.—p. 429.
*Syndromes of the Central Gray Nuclei. G. Bickel.—p. 434.
Parkinsonism After Epidemic Encepehalitis. Piguet.—p. 448.
Reinfection with Syphilis; Two Cases. G. Cornaz.—p. 453.
Attempt at Suicide with Strychnia. Recovery. F. Loup.—p. 455.

Tuberculosis with Rheumatism.—Betchov states that 60 per cent. were cured of the tuberculous patients at the sanatorium in his charge who had rheumatism in their antecedents. The general average cured among all the 500 tuberculous patients was only 20 per cent. In those with rheumatism the tuberculosis seemed to be exceptionally mild and curable. Tuberculous rheumatism may be benefited by the salicylates like ordinary rheumatism. His experience has demonstrated that an attack of acute articular rheumatism may be an actual crisis of the tuberculous infection. In this case it represents an effectual immunization process. If it occurs during a latent phase of the tuberculosis, there may be nothing to distinguish it from ordinary acute articular rheumatism.

The Syndromes of the Central Gray Nuclei.—Bickel remarks in concluding his analysis that the symptoms for which the thalamus is responsible are essentially of a sensory nature, while the striatal syndromes are exclusively motor. The corpus striatum is an independent center, the supreme center of the automatic motor system independent of the cerebral cortex.

Schweizerische medizinische Wochenschrift, Basel

Aug. 3, 1922, **52**, No. 31

*Bile in Relation to Bacteriophagia. R. Doerr and Grüninger.—p. 761.
*Digestive Hemoclasis. J. E. Wolf.—p. 764.
*Argyria After Collargol Treatment. T. Tobler.—p. 774.
Sprains of Large Joints. C. Kaufmann.—p. 776. Conc'n.
"Gynecology and General Disease." F. Haeberlin.—p. 780. Reply. Walthard.—p. 781.

Relations Between Bile and Bacteriophagia.—Doerr and Grüninger injected colon bacilli directly into the gallbladder of rabbits. Then they injected a powerful bacteriophagic lysin for colon bacilli, making the injection by the vein and repeating it the fourth and seventh hour. Conditions were thus exceptionally favorable for ridding the rabbits of the colon bacilli if bacteriophagia is capable of accomplishing this. The outcome was constantly and entirely negative. The rabbits' blood showed the colon bacilli present along with the lysin.

Digestive Hemoclasis.—Wolf concludes from his tests of Widal's hemoclastic crisis that it is not only a constant sign of diffuse liver disease but is one of the most sensitive reactions known to date. He experimented with meat, white of egg and glucose, but found Widal's 200 gm. of milk most convenient. The drop in the number of leukocytes is the most constant and the most significant phenomenon of the hemoclastic crisis. It throws light on alimentary anaphylaxis, confirming Widal's assertion that insufficiency of the proteopexic function of the liver is the cause of all these disturbances. He tabulates the details from a large number of cases of various diseases, recording the various elements of the hemoclastic crisis, besides the leukopenia, and discusses the theoretical bases of the test. He offers another explanation for the phenomena observed, namely, that it is the function of synthesis in the liver that is modified, and thus the amino-acids pass unchanged through the diseased liver, and these are responsible for the hemoclastic crisis. Test ingestion of 15 or 30 gm. of amino-acids induced a very pronounced hemoclastic crisis in ten or fifteen minutes.

Chronic Argyria.—Tobler reports a very pronounced case of universal argyria in a woman of 54 who had been given in one month 84 collargol pills of 0.01 gm. each, plus 38 tablespoonfuls of a 1 per cent. solution of collargol, and 75 c.c. of a 2 per cent. solution by the vein. No effect on the disease of the biliary apparatus for which the treatment had been given was evident, and the silver salt was dropped. Necropsy ten years later showed the main deposits of silver in the kidneys, liver and blood vessels. He knows of only one other case of chronic argyria from collargol (Crispin). These experiences warn to be cautious in giving silver arsphenamin and similar preparations. Unwitting summation of several courses might induce chronic argyria. Lochte has already reported a suspicious case of the kind.

Policlinico, Rome

July 1, 1922, **29**, Medical Section No. 7

*Glycemia and the Liver. P. Albertoni.—p. 349.
*Glycemia. S. Silvestri.—p. 362.
*Glycemia in Infectious Diseases. L. Dertil.—p. 391.
The Sugar in the Cerebrospinal Fluid. C. Maugeri.—p. 400.

Glycemia and the Liver.—Albertoni comments on the almost perfect protection afforded by the sound liver against excessive intake of sugar. Test ingestion of 50 or 100 gm. of glucose does not increase the sugar content of the blood in the healthy. With disease of the liver or pituitary, the hyperglycemia may reach a very high figure. In exophthalmic goiter and some cases of traumatic paraplegia, the sugar content was found high to start with, but it was not raised further by the test ingestion of sugar. Hyperglycemia without glycosuria after the sugar test was noted in some cases of cirrhosis or cystic degeneration of the liver, in organic nervous affections, in kidney disease, etc. The most reliable method for studying test glycemia, he says, is Allihn's mercury nitrate technic, although the micromethods are reliable enough for comparison and pointers for treatment.

Glycemia.—Silvestri reviews the history and present status of our knowledge of glycemia, and reports experiences with test ingestion of 20 gm. of glucose in 200 gm. of distilled water. Even this small amount alters the sugar content of the blood, and answers all the purposes of the test. He extols the practical information to be obtained by this means as to the course of diabetes. He regards hyperglycemia as a manifestation of some grave upset in the general metabolism and not merely of the carbohydrates. As the sugar content of the blood declines in fasting diabetics, the acetone bodies in the urine decline with it. Test injection of epinephrin throws light on the mechanism of diabetes, demonstrating that sympatheticotonia is responsible in some cases for the inhibiting of pancreas functioning. The work issues from Ascoli's service, and two groups of experiences are tabulated.

The Glycemia in Infectious Diseases.—Dertil's tables give the findings in from five to nine cases of pneumonia, typhoid and epidemic encephalitis, with smaller groups of other diseases. The different infections did not show much difference in respect to the height of the sugar content, but she found it higher in proportion to the height of the fever. She accepts therefore that the high temperature transforms into glucose the glycogen stored in the liver.

Rivista Critica di Clinica Medica, Florence

June 5, 1922, **23**, No. 16

*Sign of Meningitis. P. Picraccini.—p. 181. Conc'n No. 17, p. 193.

June 15, 1922, **23**, No. 17

Unreliability of Chloroform Test for Syphilis. G. Lonero.—p. 197.

Chameleon Eye Sign of Meningitis.—Pieraccini calls attention anew to a sign of meningitis at the base which consists in involuntary slow movements of one eye. If both eyes are affected, the movements are not associated. He ascribes this phenomenon to irritation of trunk nerves, and states that when it is found it is absolutely pathognomonic, but it is not constant, not even in the same patient. He calls it the chameleon sign, because these lizards are said to move their eyes separately.

Repertorio de Medicina y Cirugía, Bogota

May, 1922, **13**, No. 8

*Asthma. Martin Méndez.—p. 406.
*The New-Born Child. J. Andrade.—p. 410.
Serotherapy of Typhoid. L. F. Buenaventura G.—p. 428. Cont'n.

Asthma.—Martin Méndez was one of the first to appreciate and apply epinephrin as a valuable symptomatic treatment for asthma. He reviews the progress realized in the last few years by Walker, Widal and others in the conception of asthma as an anaphylactic phenomenon, but he emphasizes that the soil on which the anaphylaxis develops has been overlooked. No one seems to have investigated the pathologic anatomy which must underlie the affection. There must be some lesion, he affirms, which attracts to the respiratory apparatus the syndrome which resembles the anaphylactic shock.

The New-Born Child.—There has been considerable discussion of late in Colombia of the alleged decadence of the race. As a contribution to sustain or refute this assumption, Andrade has been compiling data in regard to the normal standard of the new-born children at Bogota. He finds that they compare favorably with the standards in France, Spain and England, but are a little inferior to the United States standards. His data confirm anew the connection between hard work, poor food, and a low average weight and height of the newly born. The weight of the infants declines regularly in proportion to the income.

Semana Médica, Buenos Aires

June 15, 1922, **1**, No. 24

Progress in Treatment of Puerperal Infection. E. A. Boero.—p. 977.
Psychiatry Course at Buenos Aires. A. M. Sierra.—p. 981.
Differential Reactions of Ferrocyanids. J. A. Sánchez.—p. 984.
*Treatment of Puerperal Eclampsia. I. Peña and M. Oxilia.—p. 986.
Tuberculous Pyothorax. F. R. Torres.—p. 991.
*Headache of Ocular Origin. R. Argañaraz.—p. 994.
Anthrax. R. F. Vaccarezza, F. F. Inda and R. Posse.—p. 1013. Cont'n.

Puerperal Eclampsia.—Peña and Oxilia review ten years of systematic application of profuse venesection plus evacuation of the uterus in treatment of puerperal eclampsia. The

mortality—omitting two deaths from intercurrent affections—was 18.66 per cent. of their seventy-five cases. The fetal mortality was 10.34 per cent. in the cases at term, and 35.29 per cent. in the prematurely born.

Headache of Ocular Origin.—Argañaraz devotes nearly twenty pages to study of functional cephalalgia, its differential diagnosis and treatment.

June 22, 1922, **1**, No. 25

*Adenolipomatosis. N. D. Rosso and R. Denis.—p. 1033.
*Disseminated Sclerosis. O. Wernicke.—p. 1042.
*Immobilization of Spine. G. Zorraquin.—p. 1049.
Lipochrome Sarcoma of Skin. C. Pinedo.—p. 1050.
A Sarcoma in the Small Intestine. G. Garcia Diaz.—p. 1052.

Adenolipomatosis.—The illustrations of the case reported by Rosso and Denis show the diffuse symmetrical arrangement of the subcutaneous lumps in the man of 67. Syphilis, tuberculosis, alcoholism and tobacco poisoning were all prominent in the antecedents.

Multiple Sclerosis a Manifestation of "Chronic Rheumatism."—Wernicke's arguments to prove that keratoconus is merely one manifestation of disseminated sclerosis were mentioned in THE JOURNAL recently. He here presents evidence further to the effect that disseminated sclerosis is nothing more nor less than the localization in the brain of *reumatismo crónico*. Keratoconus is one of the extracerebral localizations of the same; there are undoubtedly other localizations which escape our methods of examination. The joints are the most vulnerable points in the limbs, and rheumatism attacks them first and foremost. Just as syphilis was long supposed to be merely a skin disease, we are regarding rheumatism as merely a disease of the joints and muscles. It affects the nervous system as well, but here it has been masquerading as disseminated sclerosis, a purely nervous disease. The character of the pathologic anatomy is the same in all these foci and in keratoconus where it can be studied directly.

Immobilization of the Spine.—Zorraquin uses a double T frame of wood. The cross-piece on top is as long as the distance between the shoulders, and the cross-piece at the bottom is as long as the distance from thigh to thigh. The boards are all of the same width, with a hole in the end of each cross-piece. Each shoulder and each thigh is tied to the corresponding hole, and immobilization and extension are thus complete, while access is free to all parts of the body. By raising the head end of the bed and omitting the groin straps, gravity aids in extension. The frame is held from slipping down by a third hole in the center of the upper cross-bar. A great advantage of this method is that the chest is expanded to the utmost by the fastening of the shoulders against the flat cross-bar, and this revolutionizes defective breathing habits and nutrition. It allows air-baths, sun-baths, massage and other physical measures, and the patient can even be turned face downward without affecting the immobilization and extension. The frame is like the Hawley splint for fracture of the clavicle. This improves breathing conditions so materially, he says, that the fracture of the clavicle has often proved a blessing for the victim.

Medizinische Klinik, Berlin

July 23, 1922, **18**, No. 30

*Action of Parenteral Protein Therapy. A. Schittenhelm.—p. 949.
Syphilitic Disease of the Eyes. R. Hesaberg.—p. 954.
*Protein Therapy of Gastric Ulcer. B. O. Pribram.—p. 958.
*Epiphysis Anomalies in Children. B. Valentin.—p. 962.
Calcium Wards Off Certain By-Effects of Arsphenamin. G. Stümpke.—p. 965.
*Action of Tuberculin. H. Adler.—p. 967.
Vermin and Insects in Transmission of Disease. E. Martini.—p. 963.
Recent Progress in Roentgenology. E. Freund.—p. 972.

Protein Therapy in Theory and Practice.—Schittenhelm remarks that parenteral protein therapy has a many-sided action, and many different ways of realizing its effects. It has sprung into general practice before the scientific bases for it have been worked out. He reviews the pioneer publications on it, and emphasizes the remarkable results in certain cases of arthritis and neuralgia, although it is not always successful. His experience with it has been unfavorable in pernicious anemia, typhoid and other acute infections; there was always a pronounced reaction but it seemed to do harm here rather than good. In chronic diseases it can be only an adjuvant to the specific treatment. In tuberculosis, the effect is still dubious. Rapid improvement has been reported by a few pediatricians from protein therapy for atrophic infants with anergy. It is certainly worth a trial in such cases. The localized toxic and bacteriotoxic inflammatory processes seem to be most amenable to protein therapy. Osmotherapy, such as injection of a strong solution of sugar, acts in an entirely different way, as also injection of turpentine. The effect of the protein therapy is most pronounced on inflamed cells, and this effect is probably both chemical and physical. It cannot be explained by colloidoclasis alone. The extent of the effect is realized when we see how preliminary protein therapy transforms the response to epinephrin, pilocarpin, and other drugs. Starkenstein reports that after a preliminary parenteral injection of milk animals bore without harm otherwise fatal doses of strychnin, while phenol proved more rapidly fatal. Further research will reveal differences in the action of different proteins, and enable us to distinguish between the group and the individual reactions, as we have already learned in regard to vaccine therapy, which forms one branch of parenteral protein therapy.

Successful Protein Therapy of Gastric and Duodenal Ulcer.—After a year of careful study of 77 cases of this kind, Pribram announces that a prominent place will have to be made for parenteral protein therapy in the conservative management of gastric and duodenal ulcer. In 54.5 per cent. of his cases a complete cure was realized of all the patients' symptoms, in many instances of several years' standing. In 26 per cent. great improvement was realized, and only 19.5 per cent. failed to show benefit. The proportion improved would undoubtedly have been larger if he had not made a point of having the patients keep on with their usual occupations and ordinary diet. None was taken into the clinic, and no treatment other than the parenteral protein was given. The group of 15 refractory cases included 4 with an old gastro-enterostomy. The findings with serial roentgenography, with the stomach tube, and the change in weight were accepted as the criteria in addition to the subjective findings, and the ability to eat ordinary food. A footnote adds that the percentage of the improved has increased considerably since the date of writing. The results will naturally be much better when repose and an ulcer diet are enforced. He intentionally refrained from both in order to watch the effects of the exclusive protein therapy.

Disturbances in Epiphyses in Growth Period.—Valentin refers to the affections of the hip joint, of the scaphoid bone, etc., known as the Legg, Calvé, Perthes, Köhler or Schlatter affections, and emphasizes that they have nothing in common with rachitis, and trauma is only an occasional factor. There is a congenital development anomaly, but it persists latent until the period of most active growth and exercise. The anomaly is in the epiphyseal cartilage and its vicinity, especially toward the growth center of the epiphyses. The arrangement of the vessels at this center offers a predisposition to infection as well. The familial and symmetrical occurrence and the fact that boys are almost exclusively affected, while the similar developmental anomaly in the hip joint, which entails so-called congenital luxation when weight-bearing begins, affects mainly girls—all these facts point to a congenital disturbance in the normal process of ossification plus some endocrine influence. Demel's recent research on "hyperthymus-ized" animals showed a remarkable acceleration of the growth of the bones in length. In conclusion, Valentin remarks that these new data have rendered the prognosis of tuberculous disease of the hip joint much graver, as there can be no doubt that the cases which have been reported as "cured" were merely instances of this developmental anomaly, the prognosis of which is almost always favorable. It also explains "growing pains." The illustrations show the various types.

Action of Tuberculin.—Adler examined for production of antibodies the serum of sixty-two adults taking courses of tuberculin or roentgen treatment or parenteral protein therapy with milk. There was never any increase in the specific antibodies from the protein therapy. This disposes of the

assumption that the effect of tuberculin is merely a parenteral protein action.

Mitteil. a. d. Grenzgeb. d. Med. u. Chir. Jena

1922, **35**, No. 1-2

*The Phrenic Nerve and the Diaphragm. P. Neuhöfer.—p. 1.
The Healing Process in a Duodenal Ulcer. M. Holzweissig.—p. 16.
Relations Between Goiter and Heart. Steiner.—p. 39.
*Dangers of Potassium Iodid Pyelography. K. v. Neergaard.—p. 67.
*Ligating the Hepatic Artery. A. Ritter.—p. 76.
*Surgery of Gastric and Duodenal Ulcers. A. Wydler.—p. 103.
*Neurotrophic Postoperative Colitis. E. Hesse.—p. 205.
*Gastric Ulcer. V. Orator.—p. 214.
*Protein Therapy. K. Dehio.—p. 241.

Influence of Injury of Phrenic Nerve on Diaphragm Functioning.—Neuhöfer reports a case of slight paresis of half of the diaphragm from a projectile, and one of paresis from pressure from a tumor. From these and other data cited, he thinks that we are justified in dividing the phrenic nerve as a therapeutic measure in certain conditions, and that the respiration will not suffer materially therefrom. One boy of 8 had phrenicotomy done on both sides, and over three years later the diaphragm was found still practically immovable. But the boy had developed normally, the thoracal respiration answering all purposes.

Fatality from Pyelography.—The woman of 44 died suddenly an hour and a half after 10 per cent. potassium iodid had been injected into each kidney pelvis. The necropsy findings seemed to indicate injury of the heart from the drug. A 20 per cent. solution of sodium bromid is now used for the contrast suspension, as safer and equally effectual.

Consequences of Ligating the Hepatic Artery.—Ritter adds three more to the list of cases in which the hepatic artery or one of its branches was ligated. This brings the total on record to twenty-nine. The mortality was from 50 to 100 per cent., being lowest when only the right branch had been ligated. Tests of liver functioning after the ligation will warn when the liver is suffering, and call for a flap resection. This procedure is justified by the long interval of from five to ten days after the ligation before the fatal outcome. This gives time for operative intervention when the liver is becoming insufficient.

Surgery of Gastric and Duodenal Ulcers.—Wydler reviews 247 operative cases, 1910 to 1920, in the 102 pages of this analysis of his experience. With resection, the mortality was only 9.6 per cent. while the early and late mortality of gastro-enterostomy totaled 8.3 per cent. The postoperative course and convalescence is incomparably better after resection than after gastro-enterostomy. It also does away with the danger of cancer; even during the operation it is not always possible to exclude malignant disease. He adds that gastro-enterostomy changes the shape and the physiology of the stomach.

Postoperative Gangrene of the Intestines.—Hesse describes 2 cases and gives retrospective histories of 3 others, in all of which a neurotrophic gangrenous inflammatory process in colon or ileum developed during convalescence from an operation. He ascribes it to irritation of the inhibiting nerves of the bowel and heart from traction or other injury during the operation. He regards improper food during convalescence as one factor; such experiences were never observed in his service (Petrograd) until the last few years.

Gastric Ulcer.—Orator discusses from the surgical clinic in charge of Eiselsberg the macroscopic findings with gastric ulcer.

Protein Therapy.—Dehio remarks that all forms of protein therapy represent a biologic reaction between the living cell and an alien protein. The alien protein whips up the cell to work harder, but the protein at the same time is liable to induce other effects which militate against its usefulness. If the cell is overworked or whipped up too long, it gives up and becomes paralyzed. This hampers effectual action in chronic diseases. Different persons react differently both in the healthy group and among the sick. The infectious disease may render the cell more susceptible, and also more readily exhausted. The effect of parenteral injection of proteins in the healthy would well repay study. Also experiments with different proteins. The fact that bacterial proteins act in much smaller doses than other proteins, adapt them particularly for such research.

Münchener medizinische Wochenschrift, Munich

July 7, 1922, **69**, No. 27

*Systematic Physical Exercise. A. Bier.—p. 993.
The Conception of Inflammation. H. E. Hering.—p. 998.
*Own Blood for Parenteral Protein Therapy. B. Spiethoff.—p. 1003.
Intravenous Iodin Treatment. W. H. Jansen and H. Näher.—p. 1004.
The Defensive Ferments. G. Blunck.—p. 1005.
Silver Arsphenamin in General Paresis. L. Stern-Piper.—p. 1007.
*Smallpox in Monkeys. J. Clarke Bleyer.—p. 1009.
Syringe for Treatment of Gonorrhea in Women. T. Katz.—p. 1010.
Puerperal Tetanus; Two Cases. Rothschild.—p. 1011.
Appendicitis Simulated by Strangulated Omentum. Kircher.—p. 1012.
Ether in Treatment of Whooping Cough. Veltoni.—p. 1012.
The Kielland Forceps. Zimmermann.—p. 1013. Idem. Mathes.—p. 1013.
Goat's Milk Anemia. Dettweiler.—p. 1013.
To Ward Off Complications of Gonorrhea in Males. Zinsser.—p. 1016.

Systematic Physical Exercise.—Bier declares that we are far behind the ancient Greeks in the hygiene of the body. For over a thousand years in Greece gymnastics was regarded as of supreme importance for the welfare of the state as well as of the individual, from the hygienic, military and medical standpoints, for art and even for religion. But, Bier adds, it was the naked body that was trained. The word gymnasium is from *gymnos*, "naked." The importance of exposing the whole body is only just beginning to dawn on modern civilization, and physicians must be the leaders here. They cannot be leaders unless they have practical, first-hand knowledge, and he urges medical men to attend the graduate summer course in gymnastics offered to physicians by the German College for Physical Training. Bier adds that the fact that physicians are so ignorant of the first principles of gymnastics is demonstrated again and again by the certificates they sign to release from compulsory physical training the very young people who need it most. In the graduate course to which he refers, the physicians will be trained in running, jumping, swimming, massaging each other, etc. It will be a strenuous two weeks, he admits, but the science of systematic exercise needs scientific research. The study of physiology would be far more fruitful if done on young people systematically exercising instead of on frogs and rabbit. [The course of training was held as outlined and was attended by fifty-three physicians.]

Defibrinated Own Blood in Parenteral Protein Therapy.—Spiethoff asserts that the defibrination alters the blood in some way that materially enhances its potency when injected by the vein for shock treatment. Anaphylactic phenomena are common, but can be warded off by giving a sedative. He injected from 1 to 20 c.c. of own blood from one to three times a week. The details of eighteen cases are given, mostly skin diseases, chronic arthritis and prostatitis, which showed a decided turn for the better after the injection.

Smallpox in Monkeys.—Clarke Bleyer relates that during a recent mild epidemic of smallpox among the colonists and natives of the primeval forest of the headwaters of the Uruguay river, the monkeys of the region were also decimated by the disease. Dead monkeys covered with pustules hidden in their fur were found under the trees. In certain regions the celoo species seemed to have been exterminated by the disease although it was exceptionally mild in the people.

Wiener klinische Wochenschrift, Vienna

July 6, 1922, **35**, No. 27

The Theory of Reticulated Cells. R. H. Jaffé.—p. 595.
Experimental Tar Carcinomas in Mice. B. Lipschütz.—p. 598.
Treatment of Febrile Abortion in Private Practice. R. Marek.—p. 600.
The Action of the Bacteriophagum in Staphylococcus Colonies. T. Watanabe.—p. 603.
Physiologic Regurgitation of Pancreatic Juice into the Stomach. W. Robitschek.—p. 604.
Carlo Moreschi's Share in the Development of the Complement Fixation Reaction. A. Ascoli.—p. 605.

Zentralblatt für Chirurgie, Leipzig

May 20, 1922, **49**, No. 20

*Operation for Prolapse of the Rectum. P. Sudeck.—p. 698.
*Acute Osteomyelitis and the Blood Vessels. A. Nussbaum.—p. 700.

Diffuse Peritonitis from Perforation of Tuberculous Gland. M. Molnár. —p. 701.
*Parathyroid Implantation in Paralysis Agitans. M. Madlener.—p. 703.

Operation for Prolapse of Rectum.—Sudeck lifts the sagging rectum up out of its bed in the pelvis and sutures the redundant portion to form a loop in the abdominal cavity. He fastens it with three stitches to the ligament of the promontory and then sutures the lengthwise incision in the peritoneum, obliterating the pouch of Douglas. The fixation to the promontory is reenforced by adhesion of the flat surface. The ampulla region then stretches straight down to the anus.

The Blood Vessels of the Bones in Relation to Osteomyelitis.—Nussbaum shows that the terminal arteries in the metaphysis admit emboli over 20 microns in diameter. This explains, he says, why large bacterial masses can find lodgment here while they are kept out of the arteries elsewhere in the bones. Smaller emboli are washed along as the arteries are not terminal in the epiphysis and diaphysis.

Implantation of Parathyroid Gland in Paralysis Agitans.—Madlener emphasizes that no parathyroid gland should ever be transplanted without establishing its identity beyond peradventure by means of the microscope. In a man, aged 52, who had had paralysis agitans seven years, he implanted in the internal oblique muscle a parathyroid gland taken from a woman, aged 32, operated on for goiter. Three days after the operation the patient declared he felt less stiff, and although the tremor showed no improvement there was a marked lessening of muscular rigidity, but there was no further improvement in this respect after three weeks. The patient was able to move about more and the masklike facial expression disappeared partly. Six weeks after the operation the condition of the patient had become the same as before the operation. Madlener thinks, however, that, in view of the prompt though temporary improvement, it is possible that there is some etiologic connection between the parathyroids and paralysis agitans. He thinks the problem should be studied further, utilizing less advanced cases.

Zentralblatt für Gynäkologie, Leipzig

May 13, 1922, **46**, No. 19

Carcinoma and Pregnancy. F. Wolff.—p. 743.
*Rapidity of Growth of Uterine Carcinoma. W. Forst.—p. 747.
Fifty Births under Hypnosis. H. Heberer.—p. 749.
*Enlargement of Nipple Areola During Pregnancy. P. Sfameni.—p. 752.
Etiology of Ectopic Pregnancy. G. Poorten.—p. 756.
"Is Effect of Collargol Due to Protective Colloids?" Böttner.—p. 760.
*Effect of Diet on Eclampsia and Albuminuria. J. M. Ruiz-Contreras. —p. 764.

Rapidity of Growth of Uterine Carcinoma.—Forst reports a case of carcinomatous tumor which developed to the size of a small fist inside of thirty-one days. The rapidity of the growth pointed to a high malignancy of the tumor, which was confirmed by the course of the disease.

Enlargement of the Areola of the Mamma During Pregnancy.—Sfameni states that his investigations lead him to conclude that the enlargement of the areola during pregnancy is not dependent on an edematous infiltration nor other analogous circumstances. The enlargement and the spreading out of the surface are, he thinks, dependent on the hypertrophy of the mammary glands. The diagnostic importance of the enlargement of the areola is considerable. There is also a prognostic significance, for if there is intensive hypertrophic activity of the mammary glands we may conclude that the functioning of the glands during the lactation period will be adequate.

Effect of Diet on Eclampsia and Albuminuria.—Ruiz-Contreras endeavors to show by the statistics of a policlinic that the diminished incidence of eclampsia during the war period was not due, as has been frequently assumed, to the decrease in the fat intake but rather to the reduced supply of meat and eggs.

Zentralblatt für innere Medizin, Leipzig

May 20, 1922, **43**, No. 20

*Injections of Epinephrin in Hypertonic Patients. E. Kylin.—p. 329.

Effect on High Blood Pressure of Injections of Epinephrin.—Kylin injects 1 mg. of epinephrin subcutaneously, and records the blood pressure before the injection and repeatedly during the next few hours. The reaction in acute nephritis proved to be the same as in healthy subjects. However, in benign nephrosclerosis there was a typical reaction different from normal, as was shown with but one exception in fourteen patients examined. Whereas normally the blood pressure rises as the result of the injected epinephrin, the blood pressure in these cases of nephrosclerosis dropped to from 40 to 50 mm. of mercury during a space of from fifteen to twenty minutes, after which it rose a little, as a rule. Palpitation, tremor and general nervousness were not noted. The patients seemed to be unaffected, otherwise, by the injection.

Polska Gazeta Lekarska, Warsaw

June 4, 1922, **1**, No. 23

Injuries of the Eye, Behind the Firing Lines, by the Explosion of Found Ammunition. E. Machek.—p. 463.
Artificial Feeding by Means of Physiologically Predigested Foods. K. Mayer.—p. 465.
Fat Embolism of the Lungs and Its Medicolegal Importance. J. Olbrycht. —p. 468.
Results in Bismuth Treatment of Syphilis. R. Bernhardt.—p. 473.
Ophthalmoscopy with the Aid of Green Light. W. H. Melanowski.—p. 475.
Epidemic of Trachoma in Insurrectionary Army of 1830. W. Reis.—p. 482.

Hygiea, Stockholm

June 30, 1922, **84**, No. 12

*The Thyroid in Diabetes. H. Bergstrand.—p. 481.
*Inoculation with Smallpox. I. Holmgren.—p. 494.

The Thyroid in Diabetes.—Bergstrand reports the discovery in three of six diabetics of distinct pathologic changes in the thyroid, analogous to those found in exophthalmic goiter. But there never had been any symptoms suggesting exophthalmic goiter. When diabetes and exophthalmic goiter are associated, the latter probably precedes the diabetes. In Bergstrand's diabetics, the changes in the thyroid were in different stages of development in the three cases, all evidently later than the onset of the diabetes. The thymus was not enlarged in any case. The six diabetics were between 12 and 50 years of age, and in two cases the diabetes had developed during a pregnancy.

Therapeutic Inoculation of Smallpox.—Holmgren gives a translation of Voltaire's "Letters on the English," dated 1727, in which he commented favorably on the inoculation against smallpox introduced into England not long before, which was regarded with horror throughout continental Europe. Voltaire states as an established fact that at least sixty out of every hundred persons are certain to contract smallpox.

July 16, 1922, **84**, No. 13

Tuberculosis of Urinary Apparatus. G. Ekehorn.—p. 513. Cont'd.
*Etiology and Pathogenesis of Rachitis. H. Kjerrulf.—p. 530.

Etiology and Pathogenesis of Rachitis.—Kjerrulf remarks that evidences of rachitis are common in the child skeletons of the stone age, found in Scandinavian countries, but the first full description of it dates from 1554. "About 1600 it became very common in England and spread over Europe almost in epidemic form." He reviews its history since, and remarks in conclusion, "The literature on rachitis shows that the necessity for sunlight and fresh air has always been emphasized by physicians in the treatment of rachitis. But it has taken nearly 300 years to supply the scientific proof of the reasons why sunlight and fresh air are so indispensable." He reviews in particular the work of Hess and Unger in this line, and the work of Lasch, who emphasized the rapidity with which the calcium and phosphorus metabolism was modified by the ultraviolet rays—in one case after only three exposures. Kjerrulf adds that no satisfactory explanation of the action of sunlight and ultraviolet rays on rachitis has yet been advanced. Huldschinsky suggests that the pigment in the tanned skin may be a mystic catalyzer for calcium. Jundell's starvation treatment of rachitis is based on the two undisputed facts that overfeeding may be an important factor in rachitis, and that the endocrine system is concerned in the metabolism of calcium. He assumes that some endocrine gland has become functionally incapable from overwork, and seeks to combat this by reducing the intake of food. He has obtained excellent results with this relative inanition, as mentioned in these columns, March 11, 1922, p. 772.